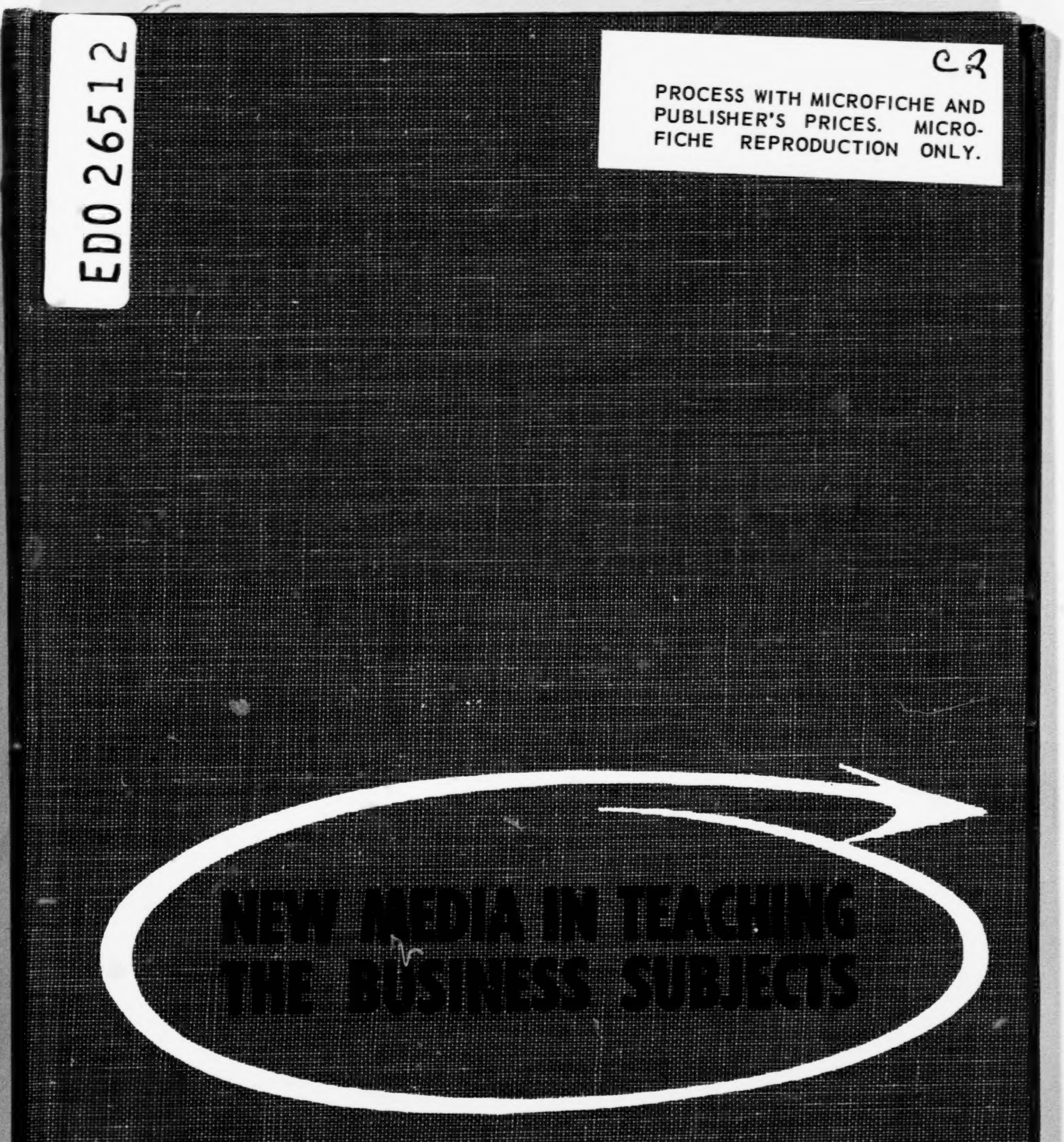
DOCUMENT RESUME

ED 026 512 VT 007 499

By-Swanson, Edwin A., Ed.
New Media in Teaching the Business Subjects. National Business Education Yearbook, No. 3.
National Business Education Association, Washington, D.C.
Pub Date 65
Note-210p.
Available from-National Business Education Association, National Education Association, 1201 Sixteenth Street, N.W., Washington, D.C. 20036 ($4.75).
EDRS Price MF-$1.00 HC Not Available from EDRS.
Descriptors-Audiovisual Aids, Autoinstructional Aids, Bibliographies, *Business Education, Instructional Aids, *Instructional Media, *Instructional Technology, Programed Instruction, Staff Utilization, Systems Approach, *Teaching Methods

A practical approach to the use of the new instructional media in business education subjects is presented in this yearbook. With the awareness of urgent problems and the expanded program for business education comes an appreciation for the instructional media, both old and new, that can be applied in everyday teaching. The new media are powerful tools and they are effective tools for those who are skilled in their use. Fifteen chapters from 18 contributors are entitled: (1) An Overview of the New Media, (2) Utilization of Staff and Resources, (3) Instructional Technology--The Systems Approach for Business Education, (4) Programed Instruction and Teaching Machines, (5) Television in Business Education: Today and Tomorrow, (6) New Media for Teaching Shorthand, (8) New Media for Teaching Typewriting, (8) New Media for Teaching Bookkeeping and Accounting, (9) New Media for Teaching General Business, (10) New Instructional Media in Business-Economic Education, (11) Dynamic Techniques for the Instruction of Business Law, (12) Applications of the New Media in Secretarial Office Practice, (13) New Media in Teaching Business Machines, (14) Newer Instructional Media in Business Mathematics, (15) New Developments in Business Communications. (MM)



ED026512

C2
PROCESS WITH MICROFICHE AND
PUBLISHER'S PRICES. MICRO-
FICHE REPRODUCTION ONLY.

NEW MEDIA IN TEACHING THE BUSINESS SUBJECTS

VT007499

PROCESS WITH MICROFICHE AND
PUBLISHER'S PRICES. MICRO-
FICHE REPRODUCTION ONLY.

NEW MEDIA IN TEACHING THE BUSINESS SUBJECTS.

NATIONAL BUSINESS EDUCATION YEARBOOK, NO. 3

2

Editor: **EDWIN A. SWANSON**
San Jose State College
San Jose, California

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

3

Published by: **National Business Education Association**
A Department of the National Education Association
1201 Sixteenth Street, N. W.
Washington, D. C. 20036

NEW MEDIA IN TEACHING
THE BUSINESS SUBJECTS

Copyright 1965 by

NATIONAL BUSINESS EDUCATION ASSOCIATION
A DEPARTMENT OF THE NATIONAL EDUCATION ASSOCIATION
1201 SIXTEENTH STREET, N.W.
WASHINGTON, D. C. 20036
$4.75

LIBRARY OF CONGRESS CARD NO. 64-8334

Permission to reproduce this copyrighted work has been granted to the Educational Resources Information Center (ERIC) and to the organization operating under contract with the Office to Education to reproduce documents included in the ERIC system by means of microfiche only, but this right is not conferred to any users of the microfiche received from the ERIC Document Reproduction Service. Further reproduction of any part requires permission of the copyright owner.

Any views expressed or recommendations implied in this book do not necessarily constitute official policy of the National Business Education Association or of the National Education Association. References to and quotations from this publication are encouraged; however, no part of this book may be reproduced without permission of the National Business Education Association, a Department of the National Education Association of the United States.

CONTENTS

CHAPTER PAGE

Part 1—New Media in Business Education

1 AN OVERVIEW OF THE NEW MEDIA 9

HERBERT A. TONNE
Chairman, Department of Business Education
School of Education
New York University
New York, New York

2 UTILIZATION OF STAFF AND RESOURCES 17

DELBERT W. LOBB
Assistant Superintendent, Instruction
Fremont Union High School District
Sunnyvale, California

3 INSTRUCTIONAL TECHNOLOGY — THE SYSTEMS APPROACH FOR BUSINESS EDUCATION 33

PHILIP LEWIS
Director, Research, Development, and Special Projects
Chicago Public Schools, Board of Education
Chicago, Illinois

4 PROGRAMED INSTRUCTION AND TEACHING MACHINES 45

LEONARD J. WEST
Associate Professor of Educational Research
Division of Teacher Education
The City University of New York
New York, New York

5 TELEVISION IN BUSINESS EDUCATION: TODAY AND TOMORROW .. 67

ROBERT M. DIAMOND
Director of Instructional Resources
University of Miami
Coral Gables, Florida

CHAPTER PAGE

Part 2—New Instructional Media Applied in the Teaching of Business Subjects

6 NEW MEDIA FOR TEACHING SHORTHAND 75
ELIZABETH T. VAN DERVEER
Professor of Business Education
Montclair State College
Upper Montclair, New Jersey

7 NEW MEDIA FOR TEACHING TYPEWRITING 87
FRED S. COOK
Chairman, Department of Business Education
Wayne State University
Detroit, Michigan
and
ROBERT E. WIPER
Chairman, Department of Business Education
Utah State University
Logan, Utah

8 NEW MEDIA FOR TEACHING BOOKKEEPING AND ACCOUNTING . . 99
VERNON A. MUSSELMAN
Chairman, Department of Business Education
University of Kentucky
Lexington, Kentucky
and
RUSSELL A. JOHNSTON
Department of Business Education
Richmond Professional Institute
Richmond, Virginia

9 NEW MEDIA FOR TEACHING GENERAL BUSINESS 113
LOHNIE J. BOGGS
Professor of Business Education
Arizona State University
Tempe, Arizona

10 NEW INSTRUCTIONAL MEDIA IN BUSINESS-ECONOMIC EDUCATION 127
RUTH B. WOOLSCHLAGER
Professor of Business Education
Northern Illinois University
DeKalb, Illinois

CHAPTER PAGE

11 DYNAMIC TECHNIQUES FOR THE INSTRUCTION OF BUSINESS LAW 139

ALVIN C. BECKETT
Professor of Business and Education
San Jose State College
San Jose, California

12 APPLICATIONS OF THE NEW MEDIA IN SECRETARIAL OFFICE PRACTICE 149

SHARON MCNUTT JACKSON
Instructor, Business Department
Washington High School
Fremont, California

13 NEW MEDIA IN TEACHING BUSINESS MACHINES 161

ROBERT J. THOMPSON
Chairman, Division of Business
Foothill College
Los Altos Hills, California

14 NEWER INSTRUCTIONAL MEDIA IN BUSINESS MATHEMATICS ... 175

ROSWELL E. FAIRBANK
Chairman, Department of Business Education
School of Business
State University of New York at Albany
Albany, New York

15 NEW DEVELOPMENTS IN BUSINESS COMMUNICATIONS 185

HARRY HUFFMAN
Chairman, Department of Business Education
Virginia Polytechnic Institute
Blacksburg, Virginia
and
SYRELL ROGOVIN LEAHY
International Business Machines Corporation
Thomas J. Watson Research Center
Yorktown Heights, New York

Part 3—Selected References on the New Instructional Media 195

NEW INSTRUCTIONAL MEDIA

Along with the awareness of urgent problems in the expanded program for business education comes an appreciation for the instructional media, both the old and the new, that can be applied in our everyday teaching. The new media are powerful tools and they are effective tools for those who are skilled in their use.

The magic of computers, the vistas of television, and the entire range of graphic technics belong to the world of business. Business teachers were among the first to recognize the importance of bringing the new instructional media into their classroom presentations.

In planning the NATIONAL BUSINESS EDUCATION YEARBOOK, No. 3, the Publications Committee of the National Business Education Association selected NEW MEDIA IN TEACHING THE BUSINESS SUBJECTS for the title. Dr. Edwin A. Swanson was the choice of the committee for the editorship of the YEARBOOK. Dr. Swanson and the contributors of the fifteen chapters have performed an outstanding professional service for the Association and for the teaching profesison in presenting the practical approach to the use of the new instructional media.

The Association is deeply grateful to each of the persons whose contributions of time and talents make this book possible. In addition, the Association expresses appreciation to Dr. Anna Hyer, executive secretary of the Department of Audiovisual Instruction, National Education Association, for her suggestions and counsel and to G. Edward Damon of Special Teaching Aids for his technical assistance. Members of the editorial staff in the NBEA office and the aides in the NEA Division of Publications are recognized for their work in seeing this NATIONAL BUSINESS EDUCATION YEARBOOK through its editorial processes and the final production. —Hollis Guy, Executive Director, National Business Education Association.

PART 1

NEW MEDIA IN BUSINESS EDUCATION

CHAPTER 1

An Overview of the New Media

HERBERT A. TONNE, New York University, New York, New York

It is safe to say that, as a rule, the extremist is usually wrong. This judgment is especially true for the person who advocates extreme use of the new media for learning, regardless of how, when, or where they are used. It is also true for the traditionalist who questions the use of any aids other than the textbook or chalkboard. In this book, the ways in which the new media can be used under various conditions are suggested. There naturally is a considerable amount of reiteration in suggestions for the use of these devices for various subjects, and under various school conditions. The writers are naturally enthusiastic about the values of the new media which they describe.

Great teaching was achieved long before any of these media were available. There were many Mark Hopkinses as great teachers, and James Garfields as great scholars. While Guiterman could glorify the log as the seat for education, it undoubtedly was a damp and uninspiring site for learning in rainy weather. Few of us will deny that a roof over one's head provides for a more continuous opportunity for learning.

We have all accepted the chalkboard and the textbook as media for learning. Yet even they have their limitations and if poorly used are ineffective. The same thing holds true for the new media which have become available. Poorly used, they are worthless. Carefully used, all of them can be of value. The problem is to determine to what extent the effort and money involved in using these new media contribute measurably to the improvement of learning.

The fewer impedimenta we have, the more a great mind can communicate easily with another great mind. Nevertheless, the concept of an ideal Mark Hopkins and James Garfield, teacher and learner, is futile because most of us are not great minds. Therefore, we need a plan in teaching. We need careful organization, and we need to make use of all the senses in all combinations in order to achieve maximum learning. The larger our national educational plant becomes, the more we are compelled to standardize and the more we need to be programed in order to achieve a common minimum of effectiveness. As the new media develop, they can burden the teacher, or they can ease his burdens. They can interfere with learning or they can help it. They may give teachers new enthusiasm or they may serve as excuses for loafing. Of course, every administrator realizes that he can provide teachers with aids of all kinds; but it is very difficult for him to force them to use them, let alone use them intelligently.

As new procedures are put into the educational hopper, the fashionable educator immediately jumps to their use and assumes the posture that anyone who does not accept the current cure for all educational problems is a stodgy traditionalist. Multitudes of devices, methods, and schemata for learning have been invented in the past. Most of them have had their brief day and then disappeared.

It is easy for the traditionalist to be so aware that many new media are passing fancies that he slows down the development of these materials. The purpose of this book, then, is to indicate how best these materials can be used, how they will help in the progress of learning, and how we can get good learning material into the classroom as quickly as possible. In this chapter are listed a number of new media with brief comments on their usefulness as well as their limitations. Succeeding chapters will develop in detail these and other media.

The use of duplicated material as a supplement to the daily lesson, as a means of enriching the textbook, as a substitute for printed text material, and for drill work, certainly is not new. Nevertheless, in recent years and even months, the means by which materials can be duplicated have been very much simplified. Some of us wonder how we were ever able to operate an office without the aid of some of these new types of heat and chemical duplicating devices. For quite some time it has been possible to make stencils of almost all kinds of material by rather expensive processes. More recently, processed paper has been provided for making spirit duplicator master sheets from most kinds of original copy. This procedure eases the work of the teacher, eliminates endless retyping and redrawing, and this makes possible inexpensive materials for daily use in the classroom. The ease with which material can now be duplicated and made available to classes does not seem to be considered a new medium by most of the writers in the succeeding chapters. This certainly is a procedure which deserves far more consideration by teachers, and, in the opinion of this writer, more consideration than most of the devices which are now treated in detail. It has the great advantage of being inexpensive, easy to develop, and easy to check before it is used in the classroom.

Every subject and all grade levels of learning can profit from the judicious use of duplicated materials as an aid to learning, now fortunately made available so easily and inexpensively.

Among the teaching devices that are classified among new media are the overhead projector and the opaque projector. Neither, in a sense, is strictly new. The opaque projector in some form or other has been known for many years and always has been used in limited form by some business teachers. The overhead projector has been known at least since World War II. However, the cumbersome device of ten years ago has been replaced by a light, easy-to-use, and durable instrument. The teacher of shorthand or bookkeeping or merchandising or even clerical practice who wants to try something new, who is a little bit bored with the daily routine that he has been carrying on for several years, certainly will find the overhead projector a fascinating instrument. He can look at the class while giving his presentation. He can prepare plates so that, as he writes, the material can fit into a pattern such as a series of "T" accounts or a specialized form of ledger or journal. If his chalkboard shorthand is less than perfect, he can use materials prepared in advance, or if his at-the-desk shorthand is better, he can substitute this kind of writing for writing at the chalkboard.

Nevertheless, the use of the overhead projector is a device for teaching rather than a substitute for teaching. It may take time from the actual learning procedure; and, like all mechanical and electrical devices, it may get out of kilter. Moreover, if the teacher must carry the projector from one class to another, set it up, prepare a space on which the material can be screened, then it is hardly worth more than occasional use. If the teacher has such loose discipline that it is necessary for him to look at the class every moment, his problems are more serious than those that can be solved by the overhead projector.

Within limits the overhead projector can stimulate the interest of the teacher and of the students and therefore is valuable. If it motivates the teacher to do better planning, it is a useful instrument. If it results in the teacher spending so much time gadgeteering that he loses time that should be devoted to actual teaching, then it does more harm than good. The value of projectors is not to be found in themselves, but in the effect that they have upon the teacher and the students in using the instrument.

Filmstrips have been in use for many years. In recent years, commercial firms have gone into the operation more eagerly and are producing excellent materials as supplements to textbooks, workbooks, or for independent use. As a means of starting a student on the road to learning, or as a means of giving the beginning teacher a basis for operations, they can be invaluable. However, if the teacher merely shows the filmstrip and then goes ahead with his teaching in the same old-fashioned way, the result can be quite negative. Ten years from now we will have many more filmstrips, and they should be better. Filmstrips should be directly integrated with textbook and workbook materials. Plans should be developed for the manner in which they are to be used in the classroom. One of our problems in using the filmstrip is securing them, getting them to the proper place on time, and having them easily accessible. If we are to spend an arduous effort at borrowing these materials and then find that they do not come on time; if we have to juxtaposition them into our teaching when we do not need them anymore, or if we have to reorganize our materials in order to make use of them, then again, they are hardly worth the effort. As in the case of the projectors, the filmstrip prepared by others is useful only if it motivates the teacher and the student to do better work.

Hardly a man is now alive who remembers the day when motion pictures were not, and even the considerable majority of us do not recall the time when audio-motion pictures (talkies) were not available. Therefore, presentation by way of television, open or closed circuit, or stored television presentations, such as kinescope materials, have been or should have been available to us for a long, long time. Good educational motion pictures have been available at least since World War II, and in experimental form long before that. Audio-motion pictures cannot be equaled in presenting situations that are far away or are difficult to reproduce in the classroom. They are superb in presenting realistically planned situations as a basis for problem solving. Television and stored television material is even more difficult to use in the usual classroom than the filmstrip or the overhead projector. The notion that people had 20 years ago—that long before this, every classroom would be equipped with a motion-picture projector—has not come through. The reason, in part, is due to the cost, the rapid growth of our school population, and the heavy turnover of teachers. Nevertheless, limited evidence of value has made administrators who must deploy limited resources most efficiently question the use of a projector in many classrooms. Will we have more motion-picture projectors and will we have more television for school use? Of course, we will. Will it be useful? Of course, it will be. In situations where a considerable number of teachers can and are willing to use them efficiently, they can be invaluable teaching instruments. But if they become primarily gadgets to be used apart from the regular teaching, or if they become so difficult to use that the processes take up too much time, then their value is doubtful. If they motivate significant learning for the student and effective teaching on the part of the instructor, then of course, the value is unquestioned.

Skill builders, simulators, and controlled readers also may have real value. They can stimulate the teacher of shorthand and typewriting to a better discipline in cultivating speed and in controlling the rate at which students are writing or reading. Properly used, these devices are to be recommended. However, if they are overused; if they become toys in and of themselves; if they interfere or are, at least, negative in their results in the teaching process, they will serve little value and may even interfere with good classroom teaching. The value of tachistoscopic devices such as the skill builders, simulators, and controlled readers depends upon the attitude of the teacher. They are easy to use if the classroom is equipped so that setting up the learning process is easy. If the teacher or student gets bored by them in the slightest way, their value is immediately lost.

While devices for taking motion pictures of students in action (in skill subjects, for example) are very expensive, some further use of these procedures is in order. Motion pictures can be taken of students taking shorthand, typewriting, or practicing any other skill at the rate of 300 pictures a minute, or about five a second. For students who have reached a plateau in their learning which they are having difficulty in overcoming, such detailed study of the students' processes might give insight into the cause of the plateau in learning. Such devices should be used by people who are experimentally inclined; and, of course, these devices lend themselves to experimental procedures for validating procedures and for iconoclastic valuation of current practice.

A relatively new device for improving teaching is the use of the many different forms of multiple outlets for giving dictation. Several, if not many, companies have elaborate schemes for multiple dictation. The teacher may become little more than a console operator. He may spend so much time operating the various outlets, encouraging the students to work in their little cubicles, and correcting the limitations of the device, that he becomes a second-rate mechanic rather than being provided with opportunities to be a first-rate teacher. In general, the simpler the device, the better. It is shocking to find in many, many classrooms that when the teacher gives dictation at high speed, a considerable number of the students are unable to cope with the dictation and, therefore, sit idly. And, in reverse, when the teacher is giving dictation to the slower learners, the more able students are bored. The resourceful teacher can soon overcome this. While he is giving dictation to the advanced students who have attained higher speeds and higher transcription competency, the slower ones can be transcribing material that has been previously learned. And while the slower learners are getting material that is geared to their limitations, the rapid ones can be transcribing and effectively putting their skillbuilding to practice. The effective teacher does not limit himself to one period in doing this. He plans in a previous period so that from the very beginning there is something for everybody to do. Nevertheless, there is a tendency for the teacher to become a mere dictation machine. The use of multiple outlet procedures certainly is one that a teacher who calls himself efficient cannot avoid using in teaching dictation and transcription. It is truly shocking to observe teachers who have multiple outlet equipment on hand that can be used effectively, but who are too lazy to develop the materials and, worse yet, are too lazy to use them—even though rather good commercially produced material has been developed. It is true, though, that little commercial material can be substituted for dictated material that is developed by the teacher for his special use.

Teachers of shorthand complain about talking themselves hoarse. If they do this for any length of time, they are at fault. There are simple devices that are available in abundance. The cost is low; the dividends are high. Of course, all students should have the opportunity of direct dictation from the teacher. No device can be a complete substitute for the teacher. Nevertheless, the multiple outlet procedure has released the transcription teacher from slavery to the dictation book and stop watch, and has made it possible for him to do individual and constructive teaching instead of being a mere dictation instrument.

The idea of team teaching is not a new concept, as those of us who recall their classes in the history of education will remember. In the early nineteenth century, Bell and Lancaster both used a rather simplified form of team teaching, making use of students and junior teachers as a means of mass production of learning. In some ways their team teaching was more stylized and canned than the procedures proposed for use at the present time. Team teaching is hardly a good example of a new medium of instruction; however, it has the characteristics of new media. The nature of the classroom under team teaching conditions changes so much that it really functions as a teaching device. There are teachers who are unusually successful with large classes. Some teachers are superior to others and their abilities should be spread among larger groups of students. Some teachers have limited imagination, but do well under the direction of a more creative person.

Like all world-improvement plans, team teaching *per se* is not the answer to good learning. It may have serious limitations. It may mean that one teacher is labeled as a master teacher and another as the assistant. It means that the master teacher often devotes his time directly to lecturing. This activity can be presented by mechanical means (television). The result is that the supposedly poor teacher actually does the teaching. Team teaching all too often enhances and encourages the very thing we want to limit in high school—the use of the lecture as a teaching method.

In the brief period in which programed instruction has been evolving, it has changed dramatically from a procedure which is primarily a machine learning device, to one which is largely text-centered. Programed learning has changed from a procedure whereby there is an exact sequence of learning of one step to another, with all kinds of controls and relearning devices, to one in which the principle now does not differ materially from the well-constructed, well-planned textbook of more traditional form. Many textbooks, particularly in the field of business education, always have had large elements of programing. For example, our shorthand textbooks are a good example of learning that always has been programed. They provide for learning and relearning and for planned repetition. They are not perfect, but neither is the programed learning sequence perfect. In fact, the newer tutor form of programed learning is, in many ways, something like a cross between the old-fashioned catechism and the more effectively developed form of textbook-oriented forms of programed learning. The value of the programed learning devices is that they may speed up learning and ought to motivate learning. For some people, it is quite certain that they do motivate and that they may speed up learning. But is it not possible, in fact, is it not probable, that for many students these devices may actually retard learning? They put the learner through the regimentation of each step in the process in order to learn a relatively small number of items. The rapid learner may be able to gather a learning concept at a glance in a traditional text. Programed learning prevents such speed-up.

The slower a student, the more he needs the human contact in order to avoid boredom. As soon as the teacher is away, the student often begins to play, and certainly the teacher cannot be with every student in using the programed learning process. It is a new toy for a brief period. He may be motivated, but is he motivated in the longrun? We have practically no research, even of limited form, that is available in the field of education to give us evidence one way or the other.

IBM has just developed a computer-based programed instruction system. The material is stored electronically and is fed to the student one step at a time. As he types his answers, the machine types back a reaction. If the answer is correct, or gives evidence as to improvement or ease of correction, the learner is given approval or encouraged. The device, by its very nature, is expensive, and it is most important for us to experiment carefully before we attempt to use such costly devices in typical classrooms.

The professional teacher will realize the values of teaching aids and the limitations involved in any device. He will cautiously and carefully, except on an experimental basis, make use of the newest devices only as they become more effective. He believes in experimentation on the completely new ideas, especially for those who are imbued with enthusiasm for them. As the procedures become more effective, he is in a better position to use them within their limitations and in a more effective form to improve his work.

This brief commentary on various new media for learning has bypassed some new teaching procedures. For example, flexible scheduling might be called a new medium for teaching. Current practices in conducting field trips under carefully planned procedures, particularly in relation to data processing, has some new elements in it. In evaluating the new media, or in considering their use, we certainly need to have some criteria for evaluation. These simple questions are valuable: Why use the materials? What are the materials? How can they best be used? How expensive are they? When shall they be used? Where are they best fitted? For what type of students are they most useful? these questions cannot be answered objectively at present. Unfortunately, experimental procedure is not sufficiently developed to give us genuinely scientific answers to the ways in which these procedures can best be used. Therefore, we must rely for a considerable period of time on carefully thought-through empiric judgments about the relative value of the new media and the use of any of these media in developing more effective teaching.

CHAPTER 2

Utilization of Staff and Resources

DELBERT W. LOBB, Fremont Union High School District, Sunnyvale, California

Any time is an appropriate time to remedy the misuse of capacities and gifts of teachers. However, once in a while a climate prevails which promises remarkable success in dealing with professional restrictions. Such a situation exists right now. Interest and support of communities are substantial. Many agencies and groups are taking a healthy, purposeful interest in education. School administrators generally understand the need to analyze the efficiency of staff organization and are taking a leadership role in promoting research and try-out in experimental patterns. Many teachers are redirecting their emphasis from goals based on easing their own burden toward goals associated with the careful examination of the new role of the teacher. In this new view, student-teacher ratio somehow actually becomes less important than the effort to provide activities for students which carry out the curriculum intent exactly. Parenthetically, it must be emphasized that no less attention should be given to securing a reasonable load for teachers; but it should not be based upon a ratio which has no usefulness in assigning students to teachers functionally. In any case, forces and people are now at work to uncover, recover, and discover better ways of utilizing teachers and resources in the educational program.

Some of the areas of misuse of professional skill and aptitude are readily apparent. In the past there has been a pervading weakness in the individualization of instruction. Educators have not been able to give enough attention to the needs, interests, abilities, and other personal qualities of students. Much of this has been due to lack of time because of the magnitude of the task. Some has been due to lack of know how and some to the assignment of priorities which gave greater emphasis to administrative routine, extraclass activities, academic hurdles, and arbitrary structuring of the student's progress through the curriculum. Whatever the reason, it is apparent that efforts to concentrate on students individually have been inadequate. Thus, the competencies and talents of teachers have not been applied at the focal point of effective learning.

There has not been room in the teacher's work week for research and preparation directly related to classroom instruction. Conscientious teachers have been able to make plans, locate resources, and study groups of students sufficiently to make an orderly, productive experience available to their classes. However, they have not had time for the analysis, organization, and location of resources which can provide a program sufficiently varied and enriched to personalize a situation for every student. Typically, research in the improvement of techniques, procedures, and materiel have been out of the question.

Time studies and job analyses have indicated that much of a teacher's energy is given to the performance of clerical tasks—tasks which they cannot perform as well as other better-trained persons anyway. Whatever it is the teacher has to give, students should be given in as full measure as possible. Just from the point of view of economy of public funds, qualified auxiliary services should be made available directly to teachers. Another similar factor is that of the interruption of educational procedures because of administrative details. It appears that among those aspects of their careers which are most injurious to the mental health of teachers is the cumulative impact of continuous classroom disruption for one reason or another. It certainly is true that the recapture of a line of thought or a mood is sometimes much more difficult than establishing it in the first place.

The challenge to business educators, as well as all others, is to muster the courage to examine present practices critically—not on occasion, but continually. Each one must become personally involved in the development of new approaches. Each must increase his individual adaptability and competency for change. Research and revision of procedures may, in the long run, be more important to the improvement of quality of instruction than specific designs for teaching. It may not be inappropriate for the profession to demand for itself a bit of acceptance of change for change's sake. Perhaps the process of change is as important as the goals of change.

BACKGROUND

Team teaching, flexible scheduling, and other dimensions of staff utilization today provide the teacher a generally accepted, interesting entry into greater opportunity for influencing pedagogical decisions and directions. What began as a frantic scurrying for answers to alleged weaknesses in American schools has become an eager, proud attempt to make adjustments and discover new answers.

It is almost impossible to assign the beginnings of current organizational patterns to any point in time. No doubt all the aspects of these patterns have their origins in the history of education. However, it may be helpful to call to mind a few of the efforts which have been made in the recent past, if for no other reason than to illustrate the breadth and variety of the related factors. This will also illustrate that there is no calculated, sequential development of such ideas. Rather, they develop in many places through a multitude of approaches which sometimes are and sometimes are not drawn together through natural affinity or a national need. Educators recall the wide publicity given to the description of the teacher aide program in Bay City, Michigan. At last something was being done to assist the overloaded, harassed teacher through the provision of assistance directly at the point of operational need in the classroom. Other districts screened their communities for available persons, such as housewives, who could be brought into action at a subprofessional level. It was discovered that there were, indeed, many such persons in most communities. Perhaps then the insular character of the classroom was destroyed forever. In a second approach, lay reader programs were instituted in the hope that students could be encouraged or required to do more writing and be provided more critical evaluation which would enable them to improve. Once again, forward-looking districts used this procedure. They seemed to be able to locate competent persons at minimum expense. Criteria were set up for the selection and evaluation of lay readers, and a real effort was made to guarantee greater quantity and quality of composition. In other instances, clerical aides were added to the staff to assist teachers with their many clerical and administrative tasks. Efforts were made to analyze the teaching job in order to determine the extent of need of such persons. Job descriptions for clerical aides began to appear. Comprehensive research was conducted at the George Peabody College for Teachers.

At about the same time, educational television began to receive attention in the journals and teacher education schools. The State University of Iowa promoted early endeavors in this area, and Iowa State College owned a television station. When channel assignments were frozen to reexamine the allocation picture, forward-looking educators urged the reservation of a portion of channels for noncommercial use by educational television. Among the public schools to take an early interest in educational television were those in Denver. Perhaps the best-known development was the experiment in closed-circuit operation at Hagerstown, Maryland. Here was reinforcement for the educational program by direct instruction, supplemental instruction, inservice teacher education, public relations, and a television training program. The Pennsylvania State University completed one of the most significant studies in educational television.

The activities with the most direct and profound effect on staff utilization were those sponsored by the National Association of Secondary-School Principals and supported by the Ford Foundation. During the course of the experimental study, over 100 secondary schools throughout the country participated. A number of areas were investigated, including administrative patterns, teaching assistance, student responsibilities for learning, teacher roles, teacher competencies, material aids of instruction, school buildings, curriculum revision, and teacher recruitment. It is unimaginable that some of this work is not known to everyone in the profession. Among the projects which received most attention through publication and visitation were those at Jefferson County Public Schools, Lakewood, Colorado; Evanston Township High School, Evanston, Illinois; Newton Public Schools, Newton, Massachusetts; San Diego City Schools, San Diego, California; and Franklin Elementary School, Lexington, Massachusetts. Strong programs have been developed in Fremont Union High School District, Sunnyvale, California; Ridgewood High School, Norridge, Illinois; and a number of other schools in many states. Of special interest to small high schools is the Rocky Mountain Area Project, Denver, Colorado. Well-known for its progress in the ungraded school is Melbourne High School, Melbourne, Florida. Cooperative relationships between schools and colleges have been apparent in many situations. Those institutions which have perhaps been mentioned most frequently are Harvard University, Stanford University, Claremont Graduate College, the University of Illinois, the University of Chicago, and the University of Denver.

One outgrowth of these studies has been the severe criticism of the secondary school schedule. Major adjustments in the scheduling are necessary to allow full realization of the values of team teaching and other organizational patterns. A most important contribution has been made in this field by Stanford University in its work with a modular concept of course structure and computer-generated flexible schedules. Joining in the development of this approach have been Fremont Union High School District, Sunnyvale, California; Marshall High School, Portland, Oregon; Lincoln High School, Stockton, California; and Virgin Valley High School in Nevada. Also, many schools are involved in the automation of traditional schedules. Recordkeeping, student reporting, and printing of all sorts of information for teachers and students are being done by means of data processing.

Current curriculum developments are naturally at the center of any important progress being made nowadays. Obviously no pattern or scheme can succeed without substance. Every discipline and subdiscipline is busily examining its rationale, *raison d'être,* and structure. National, state, and local curriculum studies are proceeding on every hand. Although curriculum revisions have not been caused primarily by experimentation in staff utilization, nevertheless team teaching, flexible scheduling, and new technologies have hastened new emphases in the various subjects.

Present views seem to stress long-range learning. The need is expressed for establishing in students an adhesive condition which will hold new learnings. Much attention is given to the process and structure of subjects as well as actual knowledge. One of the primary purposes of formal instruction is to provide a functional base for future learning. Although time-worn, arbitrary dichotomies, such as the academic versus vocational, humanities versus science, and special versus general education still exert their control, they seem to divert educators less and less from the fundamental evaluation of the discrete role and integrative aspects of subject areas. As a director of learning, the teacher must be more knowledgeable and skillful and at the same time more objective in causing a favorable interaction between students and the curriculum. With specific reference to business education, the next decade will probably represent the Golden Age. Most, if not all, students will be touched by this department. Automation, federal support, and technology in other disciplines will demand it; and new instructional equipment and procedures will see to it.

Several other factors should at least be mentioned. Among these is the use of community educational resources. Although the contribution they could make has been recognized for a long time, attempts to bring these resources to the school or take the students to them have been comparatively feeble. Typical activities have been talks or demonstrations by representatives of business and industry and excursions by students into the community on field trips or individual projects. These efforts have been rewarding, but they have left this fund of potential assistance virtually untapped. Today, local and regional councils are being formed to increase contact between school and community agencies in order to encourage the application of resources to the instructional program. This will make it possible to provide experiences for students which would otherwise be impossible. Instructional television, programed instruction, electronic data processing, and audiovisual equipment also suggest themselves. Instructional television extends the teacher's skills and abilities in a way which has not been possible before. It will not replace the teacher, but it can provide an enriched environment for learning. It is in harmony with new staff organization because it can accommodate large numbers of students at the same time, facilitate the use of resource persons, and do other specific tasks effectively. In a way, programed instruction is complementary to instructional television. Instruction can be individualized, and students can pace themselves in learning activities. Phases of all subjects lend themselves to programing, and this is certainly true in business education. In the long run, electronic data processing may do more than any other one thing to professionalize teaching and allow relief from burdensome, routine tasks. The solution of complex scheduling problems has already been mentioned as one service to be offered. Audiovisual equipment is rapidly making its appearance in the day-to-day classroom activity. Various mechanical devices are assisting teachers in the performance of their tasks. Great impetus has been given to this movement by the National Defense Education Act. On its own, business education is proceeding apace.

From the earliest days of staff utilization studies, business education has been directly involved. Teachers in this area have been interested and active in all aspects. Although commonly thought to be concerned only with the development of personal or vocational skills, business education is an area of instruction dealing with knowledges, understandings, attitudes, and ideals as well. This complexity of purpose has inspired research and empirical development in a wide range of hopeful practices.

RATIONALE

Decision making is most difficult if it avoids basic issues. Logic cannot easily be related to such a situation, and each individual involved may be further confused by carelessness in defining terms. The frequency with which this occurs is apparent if judged by references to so-called semantic misunderstandings. Today the meaning of terms such as team teaching seem so obvious that few people bother to be sure there is a mutual understanding. Staff utilization encompasses a number of approaches including team teaching and flexible scheduling. Choices between these are not required since they are complementary features of the same goals. Team teaching may be defined as the direction of learning activities by two or more persons in committed association. Obviously a team refers to more than one person, so the important point here is the *commitment* to cooperation. This requires more than an informal or occasional involvement of two teachers who happen to have coincident plans. There must be the assumption of a continuing joint responsibility for the instruction of a particular group of students. Several terms are being used interchangeably today to describe schedules which differ from the traditional pattern. Those most commonly used are schedule modification, flexible schedule, and variable schedule. Although there may have originally been a distinction, all these terms mean a change in the timetable for the day, week, or year that alters the time, room, or teacher of a group meeting. Of all these terms, flexible scheduling seems to be most frequently heard. Team teaching and flexible scheduling have a close relationship. The rationales are in harmony. Whether a school district begins with team teaching or flexible scheduling, both will probably be introduced eventually, merging into a total pattern of staff utilization.

Maximum attainment of the potential value of staff utilization patterns can be reached only if teachers are seen as directors of learning rather than purveyors of facts. This calls for the use of many kinds of situations, personnel, and materials. In addition to teachers, there may be support personnel who take some part in the planning or implementation of the program. Paraprofessionals are persons who have a substantial amount of academic preparation but lack a teaching certificate. Instruction assistants are noncertificated employees with skills and abilities which enable them to contribute directly to the teaching task. Staff clerks and secretaries are persons with competence in business skills. They perform many of the routine duties associated with teaching.

In order to understand staff utilization, it is necessary to see it in the light of evolving modern philosophy and procedures in education. A number of pressures and influences are related. Educators have pretty well made the case for quantity of education; that is, education for all youth through the high school, possibly junior college. Nevertheless, increasing enrollments make the problem of quantity persistent. These gains may be diminished unless proper attention can be given to the needs of individual students. In spite of this, the great challenge today is the improvement of the quality of the educational experience for all. Essentially, the first step is facilitating the application of the philosophical, psychological, and sociological principles already known. Educators have not adequately used present knowledge. One of the real pressures within the profession is the need to utilize educational processes which are most promising, as the group struggles for professional status. This can be partly accomplished through improved training, but it will come about mainly through a complete examination and readjustment of the assignment of personnel to appropriate functions of activity. This requires accurate descriptions of the teaching tasks and subtasks.

The pressures from outside educational circles are multitudinous. Some come from misinformation, but many come from the changing needs of our society. There is the impact of increasing population and its mobility; there are technological factors such as automation, scientific advancement, nuclear energy, and the space age; there are other relevant factors such as the emergence of nations and international politics and economics. Perhaps the greatest pressure of all is the continuing need for change and adaptation of education, not at a leisurely pace but rapidly. Schools must develop in students an understanding of principles and concepts, and the capability of changing.

Staff utilization techniques have grown out of efforts to make better use of professional talents in meeting these demands. These new procedures and patterns are not magic or medicament. They will not make the wish of each teacher come true or cure all the ills of education. Any hope for educational gains through better staff utilization must come about entirely through improvement of experiences and opportunities of students. Probably any teacher who is suited to his profession temperamentally can be successful in new approaches.

Team teaching, flexible scheduling, and use of resources are not just patterns of organization. Too many times schools spend much energy looking for enchanted structures which will automatically work for them. While it is well to observe and read about as many plans and projects as possible, transplanting of a specific design may not be fruitful. Even within the particular school, no two situations can be exactly alike. Every case is unique; therefore, staff utilization is more a spirit and attitude than a specific design.

It is unfortunate when school districts look to new methods as a solution for financial problems only. Reduction of cost should not be the major criterion for introduction of such patterns. It is more important that some of the advantages accrued be reinvested in the increased value of school experiences. Team teaching is not a solution to every instructional problem which teachers, parents, and administrators have to face. Sometimes teachers look upon innovations as a way to pry loose long-sought concessions. If teachers try to camouflage decreased student-teacher ratio, they are as guilty of unwise economy as those who would cut budgets. Likewise, providing secretarial assistance is not sufficient reason to adopt staff utilization unless it is clearly understood how this raises the level and magnitude of professional performance. Team teaching can assist in the orientation of new teachers; however, this does not relieve administrators of the responsibilities of supervision and improvement of curriculum. Parents cannot expect drastic changes in lifelong habits of their children because they are now being taught in different ways. They must guard against making such new approaches the object of blame for inadequacies in young people.

When considering new procedures, educators should clearly set forth a rationale. This serves to give initial direction to the effort and provides a logical basis for decisions. The rationale should include the best thinking of as many as possible of the persons who will be involved. It is subject to continual re-examination, revision, and reinforcement. The only justifiable basic premise is the improvement of the quality of education by increasing the effectiveness of instruction. This, in turn, results from better utilization of the staff and resources. In order to do this, personnel must be able to make the best possible use of professional skill, time, and the most effective use of material resources which enhance the instructional process. The teaching function must be carefully analyzed by all those who are involved. Then an organizational pattern can be designed with enough flexibility to carry out the tasks and adapt to changing needs and individual requirements. Staff utilization involves teachers more completely in the solution of critical problems and provides greater motivation for the betterment of teaching. Actual participation in decisions hastens the discovery of solutions and reduces the time required to place these answers into productive educational practice.

It is well not to be too impressed with the present notion of a shortage of competent teachers. The view that the competencies of master teachers should be spread over a broad area of influence is neither as functional nor as optimistic as the approach which relies on upgrading the capabilities of all teachers.

The initiation of team teaching and flexible scheduling should be undergirded by an experimental philosophy in a school district. It should be more than just a willingness to try out some new technique which is receiving national acclaim. Research should be a part of the program. The approach should be developmental in that it attempts to evaluate degrees and shades of improvement; retaining and assimilating those which are most valuable. Staff utilization is primarily a conservation measure. This implies the freeing of teacher talents, not their restriction. The human resources represented by the teaching force are liberated from certain routines and allowed to operate at a higher professional level.

A workable rationale for staff utilization demands its orientation to a learning viewpoint. Teaching becomes the direction of learning rather than just the transmission of knowledge. Also, outmoded procedures are more easily discarded if they seem to relate to the needs of learners instead of the skills of teachers. The keystone in a rationale for staff utilization is the belief that the contribution and accomplishment of the total staff can be greater than just the sum of the talents of individual teachers.

CASES

There are, no doubt, a number of excellent situations which could be used to describe innovations in business education. Perhaps programs in two school districts can be used to exemplify them. As has been stated before, no school should attempt to duplicate a specific pattern. These cases are presented merely to illustrate how two districts have viewed the possibilities of team teaching, flexible scheduling, and the use of resources.

Jefferson County Schools

In the late 1950's, Jefferson County Public Schools, Lakewood, Colorado, became involved in the experimental study of the utilization of the staff in the secondary schools, sponsored by the National Association of Secondary-School Principals and supported by the Ford Foundation. The business education department participated over a period of several years and developed some aspects of their program which are of interest here. In one situation, students in Typewriting I were taught by a team of two teachers, assisted by a part-time clerk. A similar combination of persons also worked in Typewriting II. The classes included about 75 students each. In order to provide a large room which could be supervised by one teacher when advisable, two regular classrooms were converted by the construction of a vision strip in the intervening wall. A sound system was installed with microphones and speakers in both rooms. The tape recorder was an important factor in the instructional program. Also, the overhead projector and other visual aids were extensively utilized. The use of the personnel varied from occasions when three persons gave individual help to students to those times when the class was performing under the direction of a tape recording while the three team members worked in an adjacent business machines room. Students were grouped according to skill, and there was an opportunity for providing work appropriate to the level of ability.

At another school an extensive schedule modification was introduced.

In essence it was an interweaving of teacher-student schedules which incorporated flexibility. For business education, double blocks of time were provided. Various combinations resulted, but the most typical was Typewriting I classes meeting two days a week and on alternate Fridays for 110 minutes. A less frequent plan was one double period and three single periods in a week. Shorthand and office practice were also double-blocked. No adaptations were made in the rooms, and the sizes of the groups were the same as they had been in regular classes. Audiovisual equipment and materials were used to considerable extent.

For measurement and analysis in these situations, special tests were constructed by the teachers in the school district. For example, in Typewriting I, a three-minute, straight-copy, timed writing was used to determine speed and accuracy; and an objective test was constructed to evaluate learning of information related to the subject area. Use was also made of three instruments to secure data about the attitudes of students and teachers and to determine whether or not experimental procedures were actually being used in the classroom. The first of these was a reactometer which was designed to seek students' reactions in regard to whether the experimental classes were providing more opportunity than regular classes for some procedures and practices. It included 21 items to which the student responded "Yes," "Undecided," and "No." The pupils did not identify themselves and were asked to make additional comments if they desired. The second of these instruments was an analysis of procedures which was given to participating personnel to determine whether they thought certain procedures and practices were being used more frequently and successfully in the experimental classes than in regular classes. There were 65 items for which the individual could select one of five responses varying from "Strongly Agree" to "Strongly Disagree." It was also possible to draw some conclusions from the responses regarding the attitudes of the personnel and the procedures needing emphasis. The third instrument was a measure of adaptability used to determine the team's capacity for adjusting to changing educational needs by the utilization of modern practices. It was a checklist completed for each group by the director of the study. The judgments were based on observations, conferences, reports and records, and informal inquiry. An adaptability score was derived from assigned values of responses.

Statistical treatment was utilized to determine whether there were significant differences between experimental and control groups in terms of achievement. The data from the student reactometers were analyzed to determine the items which needed special attention. The analysis of procedures was used to test for significant differences between schools and kinds of personnel as well as to find whether there were differences representing improvement or retrogression in the use of procedures in the classes. The measure of adaptability provided scores which were treated by analysis of variance to find whether there were significant differences with regard to the capacity of personnel to adjust to changing educational needs.

The results of this study showed that, in the aspects of business education related to skill — for example, typewriting speed and accuracy — there was no significant difference in the achievement of students in traditional or staff utilization classes. On the other hand, in those areas related to information and knowledges, there were significant differences which were favorable to experimental groups. Analysis of cumulative data showed that there was a discernible movement in the direction of achievement results favorable to team teaching and flexible scheduling which seemed to indicate that, as the new patterns became familiar and teachers learned to use them more effectively, greater advantages accrued in the educational opportunity for students.

The reactions of students revealed that they considered it advantageous to be in classes with team teaching and modified schedules. Singled out for particular commendation by the students were such items as: using other kinds of printed materials besides the textbook, hearing about the experiences of other students, helping the teacher plan some of the classwork, learning to think for themselves, getting individual help when needed, hearing talks and seeing demonstrations by persons from outside the school, assuming some leadership in class activities, and understanding the purposes of the subject and classwork.

Analysis of procedures revealed that practices most improved by staff utilization patterns were: making definite short-range plans, using a variety of techniques and materials, teaching techniques of study, providing opportunities for creative thinking, developing desirable patterns of behavior, organizing the work with regard to pupils of varying abilities, providing and relating supplementary printed materials in classwork, making effective use of audiovisual equipment, and using contributions of other members of the staff. Long-range examination of the measures of adaptability showed that the personnel became more adaptable as time went on. This seemed to indicate a dramatic increase in experimental-mindedness from year to year. So, although there were some problems, the project established a situation in which business education teachers felt free to investigate promising ideas for improving the quality of education.

Fremont Union High School District

In the four high schools of Fremont Union High School District, Sunnyvale, California, there has been considerable interest on the part of the business education teachers in taking advantage of the opportunity to try any reasonable plan for team teaching, flexible schedule, or use of resources. There have been teams in typewriting, introduction to business, and shorthand. There have been some variations of the schedule. In one case, a completely flexible schedule has been set up involving the assignment of time for business education subjects, on the basis of either a 90-minute period every other day or a period of 30 minutes one day and 60 the next day.

While there are many different patterns, all of them include most of the features associated with staff utilization ideas. Students have opportunities to get individual attention, to meet in large groups, and to do independent study. Teachers have considerable audiovisual equipment and appropriate facilities. One model can serve as an example: In this case, two teachers were assigned four Typewriting I classes and one Typewriting II class of about 80 students each. The students met in large groups daily in a double-sized room which was equipped with a ceiling loudspeaker, screen, an overhead projector, controlled reader, tape recorder, and a three-speed record player. Both teachers were responsible for large-group lectures and demonstrations. While one of them took charge, the other helped students at their desks. They had the assistance of a staff clerk. Filmstrips and a beginning keyboard drill book were used in place of the standard keyboard wall chart. The controlled reader allowed drills to be projected on the screen at varying speeds. Students were compelled to keep their eyes on the screen and off the keyboard. This approach permitted the teachers to spend more time observing techniques and correcting bad habits. Sub-groupings in the classroom and rotation of activities accommodated differences in student ability.

The tape recorder permitted the use of commercial tapes and those made by the teacher. These eliminated repetition on the part of the teacher from class to class. They also freed the teacher for more individual student attention. There seemed to be an element of devotion to a task when it was presented on a mechanical device and students realized it could not be repeated immediately. The overhead projector was a much more adequate tool than the chalkboard. All types of supplementary material could be visually represented in order to enrich the experience of the student. While using it, the teacher faced the class and thus maintained better communication. The size of the classroom required a public address system. In fact, it was so effective in allowing teachers to speak to students over the noise of typewriters that it might be useful even in regular classrooms.

Several means were used to obtain an evaluation of the effectiveness of these new patterns. Two tests were administered to the students in experimental and control groups which were identified in Typewriting I classes. One of the tests was a straight-copy, timed writing to measure speed and accuracy. The other was a constructed measure of knowledge of usage, procedures, and techniques. Initial tests were given in October and final tests in May. Analysis of the timed writings showed that there was no significant difference in improvement of speed and accuracy between students in experimental classes and those in regular groups. It was concluded that the typing rate did not vary greatly, regardless of the teaching technique. However, the analysis showed that the difference in gain in knowledge was highly significant and that the students in the staff utilization situations showed greater progress in this regard. Another means of evaluating the program was through questionnaires and reports from teachers and students. The data obtained from these sources were collected, organized, summarized, and interpreted in relation to the study. The evaluation revealed these advantages of staff utilization: (1) staff utilization provided more time for teacher preparation; (2) there was more variation in methods and use of materials; (3) lesson planning was done more carefully; (4) creativity was fostered in teachers; (5) procedural and organizational flexibility assisted in meeting different educational problems; (6) inservice training was readily afforded beginning teachers or those with limited experience; (7) teachers could give more individual attention to students; and (8) the clerical load of the teacher was lightened.

It would be unrealistic to imply that there are not problems associated with the use of new techniques and procedures. Where the new programs are used, the teachers do seem to have an opportunity to provide more suitable learning experiences for their students. The primary aim of the program remains the improvement of instruction through more efficient utilization of the staff and materials. There has been notable progress in preparation of materials, use of audiovisual equipment, use of personnel resources of the community, effectiveness of planning procedures, variety of motivational and instructional techniques, and other areas.

Fremont Union High School District is dedicated to a reasoned continued extension of its program. This is evident in the steady increase in the voluntary involvement of teachers in new designs. It is also shown by the work being done in this district to develop instructional television. Complete closed-circuit television systems are installed in each school. Plans are being drawn for district-wide distribution, for use of local and national programs, and for broadcast equipment. All of these have direct implications for business education classes.

PREDICTIONS

What lies ahead in business education? The next ten years could be the Golden Age in this field. The success which has been achieved and the methods described justify an extension of the professionalization of the teacher. New psychological insights into the nature of learning and the developing complexities of the instructional task seem to force teachers into the role of directors of learning. They are going to be much more capable as diagnosticians, motivators, and evaluators. It appears that much more time will be available for research, planning, and preparation of materials. The selection of material and personnel resources to project into the teaching activity will be an important part of the teacher's job. Teachers will be adept at the determination of the most appropriate tool for the moment—it may be an overhead projector or closed-circuit television or a tape recorder or programed instruction. Auxiliary services will become more and more important, and well-trained experts will be on call to assist the teacher. Facilities will take on a new look. Classrooms will be different. Laboratories and libraries will be closely associated with each department. There will be teacher work areas with a wide variety of materials and equipment.

Students will have a much greater opportunity to work independently, although under the direction of professionals. Learning will become much more individualized. Any subject or experience offered by the school will be available to students in amounts and times appropriate to their needs. There will be considerably more integration of the various aspects of a discipline; for example, in business education, the distinctions between the various skills and knowledges will not be so tightly drawn. Students will move into and out of the business education department as befits their educational goals. These experiences will range from a course in typewriting which will last only a few weeks or a course in typewriting consisting entirely of programed instruction and individual practice, all the way to a comprehensive experience which will tie the development of clerical and secretarial and other business skills into a major part of the student's high school experience.

When we add to these notions the impact of the change of skills and equipment involved in automation, the dimensions of the challenge of the next decade become fantastic. Data processing, technical skills, and new equipment of all sorts will offer a challenge and opportunity. Departmental teaming will become a reality. This will be a situation in which the entire talent and time of those in the business department will be applied to a complex pattern of individual needs of students.

In all this, great care will need to be taken to insure that the teacher remain the human bond between curriculum and the student. Then will there be better use of capacities and gifts of teachers.

CHAPTER 3

Instructional Technology—The Systems Approach for Business Education

PHILIP LEWIS, Chicago Public Schools, Chicago, Illinois

Teachers of business education have always been involved in the direct use of equipment and demonstration materials in working with students. However, the impetus given to the improvement of training methods of all kinds during World War II revealed new and improved techniques and devices applicable to instructional approaches.

Despite such advances, the general field of education as well as the specialized areas of business education have been slow to adopt the improvements available. A major reason for this situation is due to the manner in which the audiovisual and materials fields developed. Traditionally, the library was a depository and service center for book and vertical file resources. Although many additional facilities for listening to recordings and viewing visuals have been added, the major emphasis in the library is still on book-type materials.

Similarly, duplicating processes involving spirit and stencil machines were usually located in a school for clerical or training convenience. The evolution of these early devices spawned many new and flexible machines requiring little operator competence in their use, but with numerous applications for teaching and learning. Letter and document copying units, and the whole gamut of information reduction, storage, and reproduction require a re-examination of the business curriculum. The ease with which information can be transferred directly from copy to spirit masters, matrixes, and offset plates without intermediate manual recopying, comprises a real revolution in this avenue of effort.

It is a matter of record that document storage and filing methods, as generally used, result in uneconomical use of costly office space. New business systems attempt to deal with this problem, while at the same time supplying random access procedures to reduce manual retrieval time periods currently required. Such techniques must, of necessity, involve different media and equipment arranged in systems rather than as isolated activities.

Dictation records and tapes have been available for some time, but these have, in the main, been implemented as total class or small group listening exercises. Modern technology now makes it possible to provide varied listening experiences in design arrangements from comparatively simple setups to the more complicated communications centers. Without belaboring the point further, it is now essential to evaluate the use of media in instruction in combinations (or systems) rather than as mere audiovisual "aids."

Channels of Communication for Learning

Conventional approaches to curriculum formulation generally include the following steps:

1. Establishment of general objectives for the course, unit, or lesson
2. Delineation of specific objectives
3. Identification of activities necessary to achieve the objectives
4. Listing of materials and equipment involved in implementing the activities
5. Evaluation to determine effectiveness of the plan.

In working with this approach, materials and equipment are usually added after the first three steps have been completed. This technique usually results in relegating media and materials to a "sometimes thing" category. *If* time is available, a motion picture may be used. *If* the overhead projector can be fitted into a particular activity, then transparencies will be employed. *If* the students have completed their other classroom activities, then a filmstrip may be shown. Because of this situation, audiovisual materials are, unfortunately, considered as supplementary and nonessential to the mainstream of instruction.

With the advent of programed instruction, a second look was given to current theories of teaching and learning which revealed some very interesting results. In the educative process there are three major elements —the student, the teacher, and media (all materials and equipment and systems). It is important to emphasize that if the relationship of any of these three elements is altered in any way, then the roles of the other two are affected. For example, if the teacher changes his approach from lecturing to discussion, then the student must take on greater responsibility for the acquisition of background information through the use of materials and media, and also for developing competency in participating in discussion sessions. Similarly, if the teacher employs a motion picture film to illustrate effectively the operation of a calculator, then the teacher will be able to utilize the time saved for more individual work with the students. Also, the availability of programed units or sequences for use by the students may make it unnecessary for the teacher to explain basic procedures, or to perform many of the routine and repetitive duties cur-

The First National City Bank in New York uses an audio secretary in its typewriting laboratory. Taped instructions are broadcast from the console to twenty shortwave receiving sets. Two trainees may receive on a single unit from any one of three channels. The instructor can bring her own individual instruction to the trainees through a separate microphone over all channels at the same time or on individual channels.

Dictation belts are among the media used for instruction in this typewriting laboratory at Portland (Oregon) Business College.

rently involved in the instructional process. Such innovations must certainly modify the role of the teacher and change the relationship between the teacher and the student.

As a logical outcome, it is necessary that curriculum planners must now consider the student, the teacher, and media simultaneously, not as separated factors. Thus, if a manipulative device, a film, a record, or a programed unit is planned into a lesson or unit, it must be considered integral to the process and not incidental.

In the teaching-learning relationship, there are three important designs or channels:

1. The teacher working directly with the student or students
2. The teacher using media (films, chalkboard, manipulatives, and others) working with the student or students
3. The student working directly with media (programed learning, films, books, filmstrips, and the like).

It is neither essential nor desirable to select one to the exclusion of the other two in planning for instruction. Rather, the teacher is challenged to select the channel of communication which is most appropriate and effective at a particular time for a specific purpose. Such an approach requires thorough analysis of course objectives in terms of all of the resources available for instruction.

It is interesting to note trends that incorporate this total approach to instruction. Publishers of textbooks provide teachers' editions in connection with student textbooks. Recent years have seen the progressive inclusion of such items as workbooks, programed textbooks, tests, manipulative materials, prerecorded tapes and records, filmstrips, motion picture films, and even realia—not as separate items, or even as "correlations," but as instructional kits planned as a unified approach. Despite the greater and more detailed planning encompassed in an instructional kit, it does not necessarily follow that the patterns of use are rigid and inflexible. Actually, the teacher has more latitude in allowing for individual needs and differences. There is much yet to be done to evolve such kits at optimum levels of effectiveness, but within varying degrees of completeness, there are now several different kinds of "instructional systems."

The Impact of Technology

Educators have witnessed the advent of educational radio, educational motion pictures, ETV, and programed learning—all described as developments of vital significance for the schools. Unfortunately, none of these innovations have lived up to their predictions to date. The most important reasons why such exciting developments have failed to pay off include:

1. Lack of experience and funds for the proper production of appropriate materials for use with the various media
2. Proliferation of "hardware" not specifically adapted to school and educational uses
3. Lack of equipment of sufficient quality at reasonable prices that insure continuous operation
4. Insufficient personnel to relieve the teacher of additional time-consuming requirements in obtaining and operating equipment
5. Lack of coordination of facilities installed in schools to provide more flexible and more efficient services.

During the last decade, there has been a growing awareness on the part of educators and school planners that a building and its facilities must be compatible with and designed to underwrite the program of education as planned to meet local needs. Thus, the architect must work closely with the staff, with consultants, and with engineers to "tailor" the structure to the requirements of the customer.

To illustrate this basic change, it is well to consider that only a few years ago (and currently to a great extent), different contractors were responsible for installing such facilities as the electric clock system; the audio intercommunication network between the office and the classrooms; the television receiving system; closed-circuit television cables; classroom lighting; public address amplifiers for the auditorium, stadium, gymnasium, etc.; language laboratories; and a host of other conveniences. As a result of such separation of assignments among different companies, the final products were operative, but frequently too highly specialized and even mutually interfering.

In some schools, when the time correction signal is sent out on the electric clock system, the TV images on the receivers in the classrooms "tear" and are distorted. Similarly, if it is desired to pick up sound in a classroom for recording purposes, the overhead ballasts in the lighting fixtures interfere because of the ever-present "hum." Also, when it is necessary to project images on the screen at the front of a classroom, either all of the lights must be switched "off" or all of them left "on" since the circuits are wired in an arrangement parallel with the length of the room. For local television pickup for closed-circuit use, it may be desirable to include an extra lamp bank at the front of the room to increase the overall lighting in this area for better production whenever needed. Other examples can be mentioned by the dozen, but it may be more helpful to describe what a coordinated communications system would be like.

The description that follows is only one possible combination that might be selected for use in a school. The great flexibility available with such an approach makes it practical to design, through a modular plan, the provision for as many services as can be utilized or financed. In addition, it is possible to start with a basic communications network at a relatively low cost, and add the modules as they are needed. A coordinated communications system might include the following facilities and functions:

1. The internal and automatic school telephone system should be designed so that, in addition to servicing the classrooms for oral communication, there would be perhaps an additional 50 circuits for remote control and electronic distribution of prerecorded programs. Thus, instead of dialing a number from the classroom merely to connect with another room, the teacher can dial a special number that would connect the loudspeaker in her classroom with a tape recorder-playback containing the record or tape placed in the communications center. Similarly, a student in a study carrel or at a library listening station could use the same facility for individual listening.
2. The intercommunications system that is generally employed for talking between the classrooms and the office now becomes integral to the total system just described. Not only are the original services preserved, but additional circuits are provided to permit the following:
    a. A call from the classroom teacher would permit the console operator to tie in the room speaker, jackbox, or listening station with recordings or lessons emanating from the language or learning laboratories.
    b. The classroom teacher can request that a tape recording be made of classroom discussions or reports. This is accomplished by using the classroom speaker as a "microphone" and doing the taping at the console.
    c. A separate circuit and warning light in each classroom would permit teachers to dictate letters or other materials to be transcribed without leaving the classroom. The recordings would be made automatically and transcribed later by the "pool" stenographer.
    d. The intercom speaker or speakers in each classroom are connected by plug-in jacks at the front and back of the room. This permits the connection of phonographs, tape recorders, film projectors, or any audio device to utilize the overhead speaker system for better audio reproduction.
3. Proper installation of television facilities must consider the reception of signals from external stations as well as the origination of television lessons and programs within the building. In addition, sufficient channel space must be allowed for future instructional needs with various grade levels and for different activities. A coaxial cable system can do many things in addition to carrying signals for instructional television:
    a. The roof antenna system may be equipped to bring in signals from local VHF and UHF television stations, AM and FM radio stations, and provide connections for future use of microwave links or 2,500 megacycle television transmission.

b. The distribution (coaxial cable) network to the classrooms and other rooms should include dual cables for at least 12-channel capability plus the ability to view or originate television programs from any of the locations, and include audio lines for crew intercommunication and talk-back between classrooms. The same system will permit the origination and display of activities within a given classroom for purposes of electronic magnification or use with multiple repeating screens.

c. An addition in the future of one of the solid-state, light-weight video tape recorders will permit instant recording of the video and audio activities within a classroom, with immediate playback after rewind. Thus, business machine skills of all kinds need only be demonstrated "live" just once and repeated via the video tape machine as often as required—a timesaver for the teacher. The same video tape recorder, a television camera and microphone (aggregate weight at present of under 100 pounds for some products) can be taken on field trips to record items of interest, for replay over the coaxial system anytime in the future.

d. Through the use of a multiplexer and associated projection units, it is possible to electronically distribute motion pictures, filmstrips, and slides over the cable system to any or all classrooms, carrels, or study spaces from a central location.

e. Data remoting can soon be another school use of closed-circuit television. In essence, the approach would be similar to that employed in many banks for verifying signatures on checks. A teacher might telephone the school records office and request access to a particular document. The service person would merely place the record under the lens of the television camera and the classroom teacher would receive the image of the item over a special channel on the television set.

f. Computer data remoting is another future promise for schools because of the advent of the compact, less expensive computer units now appearing on the market. Such data can be carried from any classroom or office location via the coaxial cable to the computer processing room. Similarly, the spread of the use of responder systems in classrooms for immediate feedback to the teacher concerning instructional results will also be channeled to the computer for grading through the same television network.

4. A few years ago great impetus was given to the development of the language laboratory through the instrumentality of the National Defense Education Act. Many small schools with limited numbers of students could not afford such facilities for this single and specialized purpose. However, it was soon determined that all subjects and areas of learning could benefit in some way through the use of such installations and the concept of the learning laboratory or electronic classroom was born. More specifically, there are now some steno labs that incorporate many of the traditional features of the language laboratory along with some specialized approaches, to be described later on. It was also found that a single learning laboratory could be connected to service other rooms with listening programing. For example, any number of business machine rooms

can be equipped with work stations fitted with headphone outlets to pickup audio materials originating in the laboratory—or the lines can be tied in with the intercom system throughout the school.

New Devices and Techniques for Business Education

The Language Master is a recently marketed recording and reproducing machine that operates with cards of varying sizes, from about 4″ x 6″ to 8″ x 14″. Each card has a strip of magnetic tape or a deposit of magnetic oxide placed parallel with the lower edge. Since the device has dual channel capabilities, it is possible for the instructor to prepare and record the audio on the master track. As the student places the card in the device, it is pulled through and the audio reproduced through the speaker or over headphones. The student then records his version of what he heard and plays back his and the instructor's version for comparison. The student may rerecord any number of times without disturbing the master track. Such short sequence practice cards are also inscribed with drawings and imprinted with graphics, as desired. The business education student may practice with this device to learn technical, scientific, legal or medical terminology, or to improve or correct patterns of speech. The machine weighs seven pounds, is completely transistorized and may be used as a portable unit or as a learning booth deck.

The Technicolor Magi-Cartridge Projector utilizes silent 8mm motion picture film stored in small (approximately 5″ x 5″ x 1¾″) plastic cassettes. Although commercial film productions are available for purchase, any locally filmed sequences may be inserted in the cartridges for a total service and material charge of about one dollar each. Film sequences run as long as 4½ minutes or as short as 15 or 20 seconds. The ends of the films are spliced together to form a continuous belt, and, therefore, never require rewinding after using. The projector is low-priced and is about the size of a loaf of bread. Total weight is seven pounds, and films can be changed in about five seconds. In use, the device is effective in the development of skills since a sequence can be viewed over and over again until techniques are mastered. The zoom lens and an accessory (small) viewing box allow the projector to be employed with individuals or small groups. Later models of this projector are fitted with a coded stop device to show still frames as well as motion sequences and to permit programing of the presentation.

EDL Instrument Techniques in Typewriting and Shorthand Programs employ a modified and motorized filmstrip projector using quarter-frame filmstrips. The utilization techniques involve left-to-right or open-frame presentation of material at a predetermined speed. By presenting typewriting copy, shorthand outlines, adding machine numbers, arithmetic problems, or other appropriate exercises at a variety of speed levels, it is possible for the teacher to maintain accurate knowledge of student reactions, correct faulty techniques as they arise, and continuously encourage faster and more accurate student responses. The instrument is used only after basic skills have been mastered by the students.

Reflexion Wireless Listening Facilities provides an extremely simple and practical facility for students to listen to prerecorded materials at typewriting or transcription work stations without the need for connecting cables or headset plug-in to a jackbox. An audio loop induction amplifier (35 pounds) is connected to the local wall power socket. The output terminals of this amplifier unit are connected to the ends of a wire or self-adhering aluminum tape loop that borders the selected listening area (wall, floor, ceiling, table, etc.) and which is easily installed. The headsets weigh only 2½ ounces and operate without wires or batteries. Therefore, the student has complete freedom of movement within the "looped" area. A tape recorder, phonograph, or other audio source may be connected to the amplifier to provide programing. No Federal Communications Commission licensing is necessary since the system operates at audio frequencies. If desired, several separate "zones" with separate loops and separate amplifiers and program sources can be installed for multiple channel use.

Dialog Learning Laboratory may be adapted to business education instruction as a fully automated system for providing prerecorded and remotely stored magnetic tapes. Each student station is equipped with a telephone-type dial, a volume control, and a headset. Students may select, independently, any one of up to 50 programs from as many as 30 stations. In addition, the student positions provide remote control of the tape transport for record, rewind, stop, play, fast forward, and fast rewind modes plus a visible index to show actual position on the remote tape at any time.

Stenomatic-Lab is a unique technological system designed specifically for instruction in typewriting and incorporates several innovations to enable the instructor to interpret better and analyze students' efforts. This laboratory totals all strokes, cumulates the number of words typed, and simultaneously provides a dry-inked record of the typewriting techniques of each student, including the individual rhythm pattern. Students can select any one of six programed dictation exercises paced at different speed levels, according to their ability to type from the spoken word. An automatic push-button arrangement permits the instructor to monitor the program material selected by any student, or the teacher can interrupt any student's lesson material to give special instruction without class interruption. To tell whether a student is typing fast or slow, or has poor rhythm, the instructor simply pushes a button associated with a student position and electronic automation weighs, evaluates, determines, and makes instantly visible to the instructor the speed, rhythm, and total word count. A classroom display unit is also available for all to see, when this facility is switched "on" by the instructor.

In conclusion, space limitations and the continuous and rapid development of instructional technology prevent a full listing of the many worthwhile and exciting devices and facilities now available for implementation by educators. There is no single answer or single system that will do the whole job. The important person in the instructional picture is the teacher. His selection of materials, equipment, and techniques will determine the ultimate success of any approach. However, there is a real urgency to examine and to explore new avenues and new designs to enable schools to keep up with the critical challenge of doing the job better and faster for more students.

CHAPTER 4

Programed Instruction and Teaching Machines

LEONARD J. WEST, Division of Teacher Education, The City University of New York

Both psychologists and teachers are concerned with the same problem: learning. However, the manner in which the psychologist thinks about learning, the terms he uses, the conceptual framework he employs, are rather different from those of the teacher. Since programed instruction is a product of the psychologist rather than of the educator, in order to come to grips with it more than superficially it is necessary to describe it in psychological terms. It requires an enormous wrenching of the mind to think of familiar things (learning) in new ways (psychologically), but the effort to do so is worth making.

Programed instruction is neither more nor less than an attempt to insure that the necessary conditions for learning are indeed present—conditions that are the outgrowth of scientific study of learning processes by psychologists. By way of history, Sidney L. Pressey is properly credited with having first enunciated, in the 1920's, a number of ideas that parallel those of programed instruction. However, it is fair to state that he was mainly concerned with testing and that the early conceptions of programing as a full-scale instructional methodology were first developed by B. F. Skinner, the Harvard psychologist, on the basis of principles arising from research on operant conditioning carried out in his laboratories. His 1954 article in the *Harvard Educational Review* (see Lumsdaine and Glaser, 1960)[1] was the opening gun in what Wolfle has since called the most important educational development since the invention of the printing press.

CONDITIONS FOR EFFICIENT LEARNING

The conditions identified by psychologists as necessary for learning are ones that are always difficult and often impossible to meet in conventional classroom instruction. The consequence is that conventional instruction is often not maximally efficient. The promise that programed instruction holds for education is precisely one of greater efficiency, an efficiency arising directly from the meeting, in programed instruction, of those necessary conditions.

---

[1] For the convenience of the reader who wishes to brief himself more thoroughly on programed instruction, the citations in this chapter are mainly confined to two large-scale collections of papers (De Cecco, 1964; Lumsdaine and Glaser, 1960), and to several other comprehensive treatments of the field. Although the authors of the original papers are named, full citation is not given here; the reader is referred instead to the collection in which the original paper is reprinted.

It must first be understood that learning is not something we can see. Instead, we infer it from a person's performance, from something he does, from his responses. These responses may either be overt (as in saying something or making some bodily movement), or they may be covert (as in thinking). Any instance of learned behavior consists of dependably making certain responses (whether overt or covert) to certain stimuli—responses that the organism was unable to make to those stimuli before learning. The question thus becomes: What are the conditions under which we get a person to associate or connect a given response with a given stimulus? How do we get Johnny to say "8" when asked for the sum of 6 and 2, and not some other number?; to spell *occurring* with two r's?; to debit both "Freight In" and "Freight Out," and so on? We have to present, of course, the stimuli to which the relevant responses are to be attached.

Motivation and Attention. But even before that, and continuously

Motivation and Attention. But even before that, and continuously throughout the learning, we are supposed to motivate the learner. Some rather weird things have been done in the name of motivation, and some teachers cling to the strange view that learning is the inevitable result of high motivation alone. In any event, gold stars and fun and games notwithstanding, a more useful view of motivation is that it consists of paying attention.[2] A motivated learner is one who is paying attention (to stimuli); and without attention to stimuli, there can be no learning. How often, it may be asked, as we stand before our classes, can we guarantee that everyone is looking and listening? The first requirement for learning is to *insure that the learner is paying attention.*

Responding. In conventional instruction we mostly talk at the student in class and then send him home to read his textbook. The student is a passive receiver of instruction rather than a maker of responses. Much instruction is a one-way process, with little immediate and continual interchange between teacher and learner. With learning defined as associating or connecting responses with stimuli, a response must necessarily be made and it must be a relevant one. To the teacher's voice, the student's response of daydreaming is not a relevant one. The second requirement is, then, that *the learner must be continually engaged in making relevant responses,* either overtly or covertly, depending on the nature of the situation.

---

[2] Bugelski, Bergen Richard. *The Psychology of Learning.* New York: Henry Holt and Company, Inc., 1956. pp. 449-479.

Freedom from Distraction. Whether presented by lecture, textbook, or what have you, the important cues are not generally specified and pointed up. Instead they are often buried in the surrounding verbiage, and students often have trouble discovering or identifying just what the main points or important concepts are. Required, instead, is that *the relevant cues must be made prominent, and distracting stimuli minimized.*

Individual Differences. The reference here is to the sequencing of instruction. The teacher or textbook writer may move from point *a* to what he believes to be point *b* (but which is really to some students point *c*); or he may move from *a* to *c* on the assumption that the bridge between the two points is self-evident and need not be specified. His assumption will be correct for some students, but wrong for others. The person who can regularly lead nearly all his audience unerringly through his materials is a stupendous rarity. The great trick is to take individual differences (in background and in ability) into account and to determine what in fact leads to what for any given subject matter. *There must be a sequential presentation of what is to be learned that leaves no important gaps.*

A second aspect of individual differences bears on the rate of stimulus presentation. Typically we have a fixed time to accomplish our objectives. And so we lay out the topics to be treated, decide how much time to spend on each, and march along this predetermined route at a predetermined pace. Sometimes we are able to make *ad hoc* modifications as the occasion may demand, but mostly we go too slowly for some, too fast for others. Instead, *each person should learn at his own best rate.*

Reinforcement. A final point is one that is likely to be most novel to those with little familiarity with the *experimental* psychology of learning. The concept is that of reinforcement, historically stemming from but subtly more than E. L. Thorndike's concept of "reward." As Skinner has applied the concept to programed instruction, the theory is that a response is learned (i.e., made more probable of occurrence than other responses) when it is followed by a reinforcing event, which for humans was designated as simple knowledge of results. For example, the teacher's "Right," when Johnny says that Paris is the capital city of France, is a reinforcing event (stimulus) whose effect is presumed to be an increase in the probability that Johnny will again say "Paris" when next asked to name the capital city of France. If his response had been wrong, knowledge of results would then have been informational and corrective, rather than reinforcing, effects.

In any event, there is perfect consensus among specialists that an event is reinforcing only under conditions of close temporal contiguity, if and only if it follows immediately on the heels of a response. In skills especially, fractions of a second are important. Delay between response and reinforcement (or between stimulus and response) is fatal. Yet it is self-evident that in conventional instruction, knowledge of results, when it is present at all, commonly occurs so long after responding as to have little if any reinforcing effect. The typist taught under strict touch conditions is permitted to examine his typescript only after a line or so has been typed. The stenographer's transcript is returned to him the next day; his shorthand notes rarely if ever get examined. More generally, the teacher talks at his class; students are making some sort of (covert) responses to these noises in their ears—but the teacher has no way of knowing what these responses are and, therefore, no way of reinforcing correct ones, no way of feeding back to the learner information about the correctness of his behavior. *Learning requires immediate feedback for responses.*

Skinner[3] has observed that "teachers have been less given to teaching than to holding students responsible for learning" and that "In spite of discouraging evidence to the contrary, it is still supposed that if you tell a student something, he then knows it." Instead, to sum up, the major requirements for efficient learning are:

1. Attention to stimuli
2. Continual relevant responding to stimuli
3. Sequential programing or ordering of the subject matter and maximal distinctiveness of—absence of distracting—cues
4. Immediate feedback for responses
5. Rate of presentation of subject matter (stimuli) appropriate to each learner individually.

Programed Instruction vs. Conventional Educational Philosophies

Skinner[4] has most forcefully pointed to the vagueness of such achievements as "education for democracy, educating the whole child, educating for life, and so on" on the grounds that "these philosophies do not in turn suggest improvements in techniques. They offer little or no help in the design of better classroom practices." Even when education turned toward psychology, its borrowings, as De Cecco[5] has pointed out, heavily favored Gestalt psychology, which is mainly concerned with perception and other internal events and which, accordingly, suggests little if anything that one can come to grips with in determining just exactly what must happen if learning is to result.

---

[3] De Cecco, J. P. *Educational Technology.* New York: Henry Holt and Company, Inc., 1964. pp. 93, 102.

[4] Lumsdaine, Arthur A., and Glaser, Robert, editors. *Teaching Machines and Programmed Learning: A Source Book.* Washington, D. C.: Department of Audio-Visual Instruction, National Education Association, 1960. p. 107.

Instead, programed instruction is based upon identifiable conditions subject to manipulation (and therefore to control) by the researcher and the teacher. It is an early step in "the development of an educational technology based on stimulus-response psychology and the experimental findings . . . of the psychology of learning."[6] In this connection, a *sine qua non* is the replacement of the vaguely worded conventional educational objectives with precise specification in behavioral terms of the desired "terminal behavior," defined by Glaser[7] as "the performance that the student should display at the end of a specific instructional situation." In fact, whether for programing or for conventional instruction, precision in stating objectives is so crucial that all persons concerned with education could benefit from thoughtful reading of Mager's little book, which, in its way, has become a small classic.[8]

Candor requires pointing out that nowhere in the conditions for efficient learning, just outlined, does one find the word "teacher." The ground rules merely state what must happen, according to our present knowledge, in order to bring about learning. Whether the necessary conditions can in fact be adequately implemented in all situations without the teacher is quite another (but a perfectly relevant) question—one to be discussed later. For present expository purposes, programed instruction is self-instruction, to be taken literally as instruction without the intermediation of the live teacher. How is this accomplished? How do programed materials meet the learning conditions outlined?

THE PROGRAM

After specification of objectives, in the form of precise statements of the behaviors the learner will be capable of after finishing the program, the subject matter to be learned is broken down into a series of steps.

---

[5] De Cecco, *op. cit.*, p. 32.

[6] *Ibid.*, p. 69.

[7] *Ibid.*, p. 71.

[8] Mager, Robert Frank. *Preparing Objectives for Programmed Instruction*. San Francisco: Fearon Publishers, 1961.

These steps, or "frames," as they are called, are generally in the form of information incorporating or followed by a question to be answered. The learner reads the frame and either (a) composes an answer or (b) selects one from a series of options presented. He must respond.

Skinnerian, "Linear" Programs

In programs conforming to the original Skinnerian style, after the learner has responded, he is then shown the model answer (regardless of the correctness of his response) and proceeds to the next frame. The illustrative frames in Figure 1 display the brevity and very-small-step fragmentation of subject matter characteristic of such programs. Nonetheless (and, in theory, partly because the brevity of each frame makes the relevant cues salient, without competition from distracting cues), in well-constructed programs, as Skinner had predicted, an understanding of the subject matter emerges which is often quite surprising.

	Performing animals are sometimes trained with "rewards." The behavior of a hungary animal can be "rewarded" with ____.	7-1
food	A technical term for "reward" is reinforcement. To "reward" an organism with food is to ____ it with food.	7-2
reinforce	*Technically* speaking, a thirsty organism can be ____ with water.	7-3
reinforce (NOT: rewarded)	The trainer reinforces the animal by giving it food ____ it has performed correctly.	7-4
when (if, after)	Reinforcement and behavior occur in the temporal order: (1) ____, (2) ____.	7-5

Figure 1. Illustrative linear frames from the Holland-Skinner, "The Analysis of Behavior" (reproduced in Fry, 1963, Appendix C). In the original, the frames appear on successive pages rather than one below the other, as shown here.

Programs based on the Skinnerian model use constructed (rather than selected) responses partly on the grounds that emitting rather than recognizing a correct response will later be most useful, and partly on the thesis that plausible wrong options (in multiple-choice frames) induce errors. Since the student might learn his mistakes if he is allowed to make them, Skinnerian programs air at a low error rate, this objective being accomplished by excruciatingly careful sequencing of frames and by the use of a variety of prompts or hints that are employed in early frames and gradually faded out or "vanished" as the program proceeds. Also, the response is to be written (overt), not merely thought (covert). Still another—and the defining—characteristic is that every learner goes through the same frames in a fixed order (although he may be required to try again those frames he missed)—hence the label "linear" programing. However, the rationale that mainly distinguishes the Skinnerian model from its chief competitor is the insistence on the reinforcing effects on correct responses of the knowledge of results furnished by the model answer.

Finally, in a "programed book" the frames either go down the page (with model answer to any frame appearing alongside the next frame), or successive frames appear on successive pages, so that one turns the page to see the model answer and new frame. In the former instance, a shield or mask is used to cover the frames below the one being worked on.

Crowder's "Intrinsic" Programs

As contrasted with the stimulus-response-reinforcement rationale underlying the constructed-response, linear programs advocated by Skinner as early as 1954, Norman A. Crowder several years later expounded a programing rationale based, instead, on a communications model. To Crowder, as quoted in Fry[9]: "The student's response serves primarily as a means of determining whether the communication process has been effective and at the same time allows appropriate corrective action to be taken when the communication has been ineffective." The necessary program of alternatives is built into (is "intrinsic" in) the material itself, so that nothing external to the program itself is required. In other words, Crowder does not want the student to go ahead if he has made an error, but instead to undertake remedial instruction before proceeding. Responding is not for the sake of having something that can be reinforced but rather to determine what the appropriate next step is.

---

[9] Fry, Edward B. *Teaching Machines and Programmed Instruction, An Introduction.* New York: McGraw-Hill Book Company, Inc., 1963. p. 61.

In these programs with remedial branches (hence the term "branching program"), each frame appears on a page by itself. The instructional material in the frame concludes with a question and a set of responses from which the learner is to choose. Depending on his choice, he is directed to another page that either confirms his response and gives him the next bit of information (and test question) or points out why he is wrong and sends him back to the original page to try again. The tactic is illustrated in Figure 2.

Page 1

In the multiplication $3 \times 4 = 12$, the number 12 is called the product and the numbers 3 and 4 are called the

Page 15 quotients
Page 29 factors
Page 43 powers

Page 43

Your answer was "powers." We'll get to powers of numbers pretty soon. The numbers that are multiplied together to form a product are called "factors," not "powers." Now return to page 1 and choose the right answer.

Page 29

Your answer was "factors." You are correct. . . . Is it possible for the same number (same quantity, that is) to be used as a factor more than once in forming a product?

Page 59 Yes
Page 71 No

Page 59

Your answer was: "Yes." . . . . For example in the multiplication $4 \times 4 \times 4 = 64$, the number 4 occurs as a factor three times. What product would you reach by using 2 as a factor 3 times?

Page 81 6
Page 3 8
Page 17 9

Figure 2. Sample frames illustrating "intrinsic" or branching programs. (From Crowder, as quoted in Fry, 1963, pp. 62-63.)

As shown in Figure 2, learners do not go through all the frames in a fixed order; instead, one's route through the program depends on the correctness of one's responses. If you make no mistakes, you stay on the main track; if not, you are branched off, as required, into remedial sequences. Since the order of the frames does not correspond to the serial numbering of the pages, in book form such a program is called a "scrambled book." Note, also, that the overt response is the irrelevant one of turning pages. Responding to the question in each frame is in the covert form of reading.

Mathetics

A third major programing tactic, invented by Thomas A. Gilbert, is called "Mathetics" (from the Greek, *mathein,* meaning "to learn"). Its own protagonists admit to the complexity of its basic procedures (for program construction, not for the learner), and cite as its chief precept an application of reinforcement theory called "backward chaining." That is, the learner is shown the last step in a sequence and then works progressively backward to the first step. In teaching long division without remainders, for example, the learner might first be shown the zero difference between the last two entries in the process. Another major distinction is that it employs the largest units of which the learner is capable, on the thesis that if the unit is too large, the error is quickly discovered in tryout and remedied; whereas if the unit is too small, the inefficiency goes undetected. In contrast, both branching and linear programs tend to use quite small steps, and linear frames are often restricted to a sentence or two. The complexity of mathetical procedures has limited the number of programs to date, as compared to those produced by linear or branching techniques. Accordingly, illustrative "units" (not frames) and further details are not presented here but can be found in *Programed Instruction.*[10]

Recent Modifications of Basic Programing Styles

Practically from the start, programers began to utilize in the same program features and techniques based on both Skinnerian and Crowderian concepts. Linear programs often use selected responses as well as constructed ones, sometimes within the same frame, as in the following example from a psychology program.

> As a way to get a learner to make correct responses
> to ____________, trial-and-error learning (is/is not)
> very economical.

Also, insofar as the extreme brevity of frames in early linear programs was sometimes found to lead to boredom, one now sees frames deliberately ranging widely in length, as in the following two (nonconsecutive) frames (the second one, a summary review frame) from a program on the uses of the comma.[11]

---

[10] *Programed Instruction.* New York: The Center for Programed Instruction, Teachers College, Columbia University, 1963-64. Vol. 3, Nos. 3 and 4 combined.

[11] West, L. J. *300 Commas.* New York: McGraw-Hill Book Company, Inc. (Gregg Division), 1964.

In informal writing it is proper to use loose, or _______, punctuation.

(*Note*: E and NE stand for essential and nonessential, respectively.)
Consider the unpunctuated sentences:
a. The merchandise arrived.
b. The merchandise arrived *before it was expected.*
c. The merchandise arrived on Monday *before it was expected.*
Do *a* and *b* mean the same? (yes/no) _____. The dependent clause in *b* is therefore (E/NE) _____. If we drop the dependent clause in *c*, do we still know when the merchandise arrived? (yes/no) _____. The dependent clause is merely a comment on the main thought in (*b*/*c*) _____. We need a comma in (*b*/*c*) _____ because the dependent clause in it is (E/NE) _____.

Another instance of the flexibility of programing techniques arises from the awareness that no estimate of the background and aptitudes of even a quite homogeneous group of learners can be more than a general estimate. While the programer must have in mind some particular "target population" for his program (e.g., typical fourth graders, those who demonstrate a specified level of mastery of algebra), still, differences exist and we do not want to force the learner through a sequence of frames covering something he already knows. Accordingly, in some otherwise linear programs, as well as in branching programs, bypass techniques are employed. For example, in a chemistry program, the learner who shows by his response to an early frame that he already knows the difference between an organic and an inorganic compound is directed to skip the frames bearing on the distinction and to continue at some specified later point in the program. Branching, in other words, can go forward as well as backward. In general, the combinations and permutations of programing techniques designed to take individual differences more completely into account are already in evidence and represent one of the most active research areas.

How a Program Is Written

The particular feature (from among many) that distinguishes writing a program from writing conventional, ordinary-textbook materials is that the responses of trial subjects utilized throughout program construction (commonly, for each little sequence of frames), show the programer whether his frames are resulting in learning. In other words, student responses furnish feedback to the programer, who continuously revises and rewrites during the course of program construction until it is evident from the correct responses of trial subjects that the program is an effective one. This is, of course, not all there is to program construction and evaluation. As one of the issues of *Programed Instruction*[12] has amusingly illustrated, it is easy enough to write frames that elicit correct responses even though unadulterated nonsense is purveyed, as in:

> To disglop the xeron, you must first revurl the CORASCIS.
> The ________S is revurled before the xeron is ________ed.

Accordingly, low error rates on the program are not a sufficient evidence of learning. Post-program performance on an appropriate test is a necessary part of program evaluation. In fact, in immediate awareness that it is just as easy to write a bad program as a bad book and in order to protect the buyer as well as to alert programers, a Joint Committee on Programed Instruction and Teaching Machines of the American Educational Research Association, American Psychological Association, and the Department of Audiovisual Instruction of the National Education Association has prepared "Criteria for Assessing Programed Instructional Materials." Their 1962 Interim Report has been published in a number of places[13] and should be read by those considering the purchase of programs, whether for school or individual use.

TEACHING MACHINES

As between "programed instruction" and "teaching machines," it is the latter term that has captured the public's fancy and that has (needlessly but understandably) generated emotional rather than rational reactions. As will be indicated, true "machines" have their place in instruction. Those instructional labors that can be executed at least as well by a device as by a human being (not to mention certain crucial functions that humans cannot conceivably carry out) should be welcomed as freeing the human to perform functions no machine can perform. This has been the rule in nearly all human endeavors: the horse has given way to the tractor and the broom to the vacuum cleaner, and neither the farmer nor the housewife has been heard to complain. Machine has replaced muscle and it has replaced human mind, too, as in the instance of the desk calculator and the pencil for arithmetic operations. Skinner's early remark was that the classroom was less automated than the kitchen or the barn and that "in any other field a demand for increased production would have led at once to the invention of labor saving capital equipment. Education has reached this stage very late, possibly through a misconception of its task."[14]

---

[12] *Programed Instruction*, 1962. Vol. 2, No. 1.

[13] De Cecco, *op. cit.*, pp. 404-420.

In any event, it must be understood that the program and not the machine is the heart of instruction. The machine is essentially a house for the program, a means for displaying and manipulating the program and for making performance records of various sorts. Even so, a machine can be invaluable (e.g., in testing out a program) and, in fact, indispensable for some purposes.

Functions and Advantages of Machines

In programed or scrambled books there is nothing to prevent the learner from "cheating," from looking at the model answer in advance. Machines have as one of their routine features, the inability of the learner to expose the model answer until after he has responded or, often, to amend his response after seeing the model. However, it has become apparent from comparisons of programs in book vs. machine form that learners tend to do equally well on post-program tests. Such cheating as may occur without machine control may in fact be helpful. Seeing the model answer in advance of responding is a form of "prompting," and it is well established that prompting is a powerful technique early in learning. Besides, in a good program, frames are so skillfully written that learners usually find little if any necessity to look at the model answer in advance. Accordingly, insofar as prevention of cheating is an endemic notion among teachers, it is probably the least consequential aspect of the books vs. machines issue.

For research purposes as well as for evaluation of students by teachers, the machine can make, depending on its sophistication (i.e., its complexity and therefore its cost), a record of virtually any desired aspect of student behavior. It can record responses, response times, number of errors, and so on.[15]

With respect to purely instructional functions the flat requirement of a machine program rather than one in book form depends on the task to be learned. Purely verbal tasks seem to lend themselves as well to printed programs as to machine-housed ones. But for perceptual-motor skills and for any task in which the desired terminal behavior consists of motions of some sort, machines would appear to be indispensable. Proceeding at one's own rate is a defining characteristic of programed instruction. Nevertheless, in tasks whose mastery requires high speeds (high response rates), plugging away at one's own rate is a vastly uneconomical way to acquire skill, and devices that pace the learner at an appropriate rate are required. Note that this does not violate the requirement of individualized instruction; the device must set a pace appropriate to each learner individually. For certain objectives, a music program has to make sounds in the learner's ears, as does one aimed at teaching a person to speak a foreign language. Manipulative skills (e.g., factory operations, maintenance and repair of machinery) are difficult and perhaps impossible to deal with adequately in purely verbal form; motion picture displays might be required instead. In this connection, Crowder early foresaw all this, and the Autotutor developed under his direction is a machine whose program is on film and which can display that film either one frame at a time or in motion picture sequences. Thus it can, in principle, display and manipulate any program that can be put on film, verbal as well as manipulative. Autotutor, as it happens, presents only visual, not auditory, stimuli; but there is no limit to what could be built into a device if desired. To a technology that can send satellites orbiting around the earth, building teaching machines of any imaginable complexity and sophistication should present few difficulties.

---

[14] Lumsdaine, *op. cit.*, p. 137.

[15] Stolurow, Lawrence M. *Teaching by Machine.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Monograph No. 6. Washington, D. C.: Government Printing Office, 1961.

Teaching Machines for Secretarial Skills

Among the business subjects, secretarial skills are obvious candidates for automation. In this connection, the dictation record, the tachistoscope, the Perceptoscope, the Controlled Reader, and the multiple-channel shorthand "laboratories" are not teaching machines. They are stimulus display devices whose primary function is to pace the learner's responses —at more or less appropriate rates. And they are nonadaptive; they do not modify their display on the basis of the learner's responses. IBM is said to be working on machine programs for machine (not symbolic) shorthand. To this writer's knowledge, the only extant instance of fully adaptive gadgetry for teaching keyboard skills is the work of the British engineer and cyberneticist, Gordon Pask. His device for training keypunch operators has already been described in a source[16] readily available to business teachers and the description will not be reproduced here.

---

[16] Stolurow, Lawrence M., and West, Leonard J. "Teaching Machines and Self-Instructional Programming." *Delta Pi Epsilon Journal* 3:1-27; April, 1961.

The only general observations that deserve repeating are that (a) an adequate device for secretarial skills (typewriting and/or shorthand) must be fully adaptive, quickly sensitive to the learner's response rate, errors, and error rate, and able to amend its stimulus display accordingly; and that (b) the problems in building such devices, while not simple, are wholly within present technological means.

Computer-Based Instruction

During the first flush of activity in programed instruction, a spate of machines appeared on the market, many of them not very durable and not particularly adequate. A machine is useless without a program for it, and in early days it was almost the case that machines outnumbered published programs. Further, since any given machine can take only a program tailored for it (on film or on cards or on fanfold paper or on rolls or on single sheets), machines and programs are not interchangeable. There has not as yet been standardization of both machine and program characteristics.

Partly because existing machines are in general rather primitive compared to what modern technology could do and partly because program development is itself in an early and not very sophisticated state, for very many school tasks programs in book form have been found to be as effective as the same programs housed in a machine. But beginnings have been made in computer-based instruction. In 1958, Rath and others[17] (or see a brief abstract in Lumsdaine and Glaser[18]) combined a digital computer and an electric typewriter to teach binary arithmetic. The student typed his responses on the typewriter while the computer, instantly sensing these responses, furnished immediate feedback to the student. It also counted his errors and backtracked to earlier problems if the error rate was excessive. This is a mere beginning, and computer-based instruction is now undergoing extensive inquiry. There is no present technological bar to instruction in parts or all of numerous subject matters being "managed" simultaneously for all students in an entire school (or school system) by one computer. In fact, as an imaginative look into the future, Ramo[19] has described a high school of the future that is both thrilling and scary, calling to mind the best of H. G. Wells, if not the worst of Aldous Huxley and George Orwell. It may sound to some like science fiction, but Ramo is one of the country's leading engineers, in the forefront of new developments, and the necessary technology is ready to be tapped. It is programing know-how that is far behind technology, and implementation of Ramo's prediction must await vastly greater knowledge of learning processes and a rational rather than emotional attitude by the public and by teachers toward the application of technology to education.

---

[17] Galanter, Eugene H., editor. *Automatic Teaching: The State of the Art.* New York: John Wiley and Sons, 1959. pp. 117-130.

[18] Lumsdaine, *op. cit.*, p. 676.

[19] *Ibid.*, pp. 367-381.

In the meantime, programed and scrambled books will probably be used for many years. *Programs '63*[20] lists 352 published programs available for purchase as of September 1963 (up from 122 listed in 1962); and educational publishers are heavily involved in and highly sensitive to the problems of publishing programed materials, problems that did not exist for conventional materials (see their comments in *Programed Instruction*[21]). At present writing there are many programs in collegiate business subjects, but just a few at the high school level.[22]

SOME TENTATIVE ANSWERS TO SOME SCIENTIFIC QUESTIONS

Psychologists are only too keenly aware of the limitations of our present knowledge of learning processes and of the application of such knowledge to education. They see programed instruction not only as a means of improving education but also as a means of adding to their knowledge of learning processes, uncontaminated by the variability among human teachers that has been the curse of research on instructional methodology. In the brief span of ten years, psychologists have come a long way from the original "lay out the subject matter, get 'em to respond, and reinforce 'em for responding" rationale with which programed instruction began. Various papers in De Cecco's collection[23] call into question (for some kinds of tasks) the necessity of active (overt rather than covert) responding, suggest that simple knowledge of results may not be reinforcing in all instances, show that errors may not be as harmful as was originally thought, and so on into many other issues as well.

Among these many issues and considering the body of evidence, Lumsdaine[24] has expressed a change from earlier views among programers that merits mention here. It is not the model answer, the confirmation, the reward schedule, that seems to count, but rather the skill in frame writing, which leads, to put it technically, to close temporal contiguity between stimulus and response. Skill in prompting the learner in early frames and skill in vanishing these prompts so that the learner eventually stands on his own feet is what will bring about learning. In this connection, Klaus[25] has furnished some detailed advice on linear frame writing. Also, various issues of *Programed Instruction* have included a "Faulty Frames" section that is enormously instructive.

---

[20] *Programs '63, A Guide to Programed Instructional Materials Available to Educators by September 1963.* The Center for Programed Instruction, Inc., in cooperation with the U. S. Department of Health, Education, and Welfare, Office of Education, Bulletin 1964, No. 3. Washington, D. C.: Government Printing Office, 1963.

[21] *Programed Instruction,* 1964. Vol. 3, No. 8.

[22] *Programs '63.*

[23] De Cecco, *op. cit.*

[24] *Ibid.,* pp. 77-91.

In contrast to the only too common *educational* practice of interminable argument over issues on mostly traditional bases, while we continue to employ instructional practices with little if any factual evidence behind them—we see here what happens when a *scientific* attack is made on instructional questions. The ink on Skinner's first article on programing was hardly dry before *experimental* inquiries into techniques for program construction and into the psychological theory that underlay them was begun. The consequence is that great strides have been made in just ten years, both in our understanding of learning processes and in their application to instruction by programs. Let teachers and educators take a lesson. Schramm[26] has recently published an annotated bibliography covering all the research through early 1963.

SOME TENTATIVE ANSWERS TO SOME PRACTICAL QUESTIONS

Among the questions about programed instruction that seem to be uppermost in the minds of teachers are:

Are Programs Better Than Teachers?

This is not, at present, an answerable question or even the right kind of question to ask. Both programs and teachers range from horrible to wonderful. A good teacher is, by definition, better than a bad program. Even the wildest enthusiast for programing would not attempt to pit any program he could conceive of against the truly great teachers in the world's history: the founders of the great religions, Socrates, Mark Hopkins (on the say-so of President Garfield), et al. For most of us, however, the fingers of our hands are sufficient to tick off the really first-rate teachers in our own experience. If genuine quality control comes to be exercised in the "manufacture" of programs, it is self-evident that programs will out-teach most if not all teachers, primarily because the necessary conditions for learning are beyond the single teacher faced with a class full of students and partly because human teachers (like human butchers, bakers, and candlestick makers) vary enormously in their abilities. To the often-voiced objection that the human can, while the machine cannot, "inspire," the writer has not found "inspiration" to be in notable supply among the teachers in whose classes he has sat as a student, and he doubts that others have either.

---

[25] *Ibid.*, pp. 35-50.

[26] Schramm, W. *The Research on Programed Instruction: An Annotated Bibliography.* U.S. Department of Health, Education, and Welfare, Office of Education, Bulletin 1964, No. 35. Washington, D. C.: Government Printing Office, 1964.

Just the same, there was an early rush toward comparisons of results from programed instruction with those from live teaching, with sometimes fabulous and sometimes disappointing results. Such comparisons have virtually disappeared because they cannot lead to a general answer. All that can be shown by such tactics is that Program X is or is not better than Teacher Y or that Programs A, B, and C are or are not better than Teachers L, M, N, O, P. This is not the same as saying that programs-in-general are or are not better than teachers-in-general. Actually, poor results from programs were sometimes due to insufficient monitoring of their use. Teachers unaware of the effects of massed practice on motivation kept students working continuously on their programs day in and day out—a tactic that is no less harmful with programs than it is in live teaching. Also, insofar as most of these comparisons involved early products of the programing (art? science?), the question of the relative merits of self-vs. live instruction is a premature one. Even when the question becomes an appropriate one to ask, it would have to be looked into on a sufficiently broad scale—on a school system wide basis at least. Nonetheless, taken together, the small-scale findings that have been available are such as to encourage programers greatly.

Programed and Scrambled Books vs. Teaching Machines

As indicated earlier, it depends on the task to be learned. Resist the blandishments of those who would sell you a verbal (printed) program as a means of acquiring high response rates in a perceptual-motor skill. But as a professional person, open your doors wide to reputable investigators who need your classroom as a laboratory in which to investigate programing variables, with or without machines.

On the question raised, Stolurow[27] sees

---

[27] De Cecco, *op. cit.*, p. 441.

> . . . two extremes with little in the middle. At one extreme will be the book formats. . . . At the other . . . large-scale computer-based systems with multiple student stations. The more modest, mostly mechanical, machines . . . proliferating in today's market will drop out of use in the school.

Linear vs. Branching Programs

Even though there has been some blurring of some of the distinctions that first separated linear from branching programs, the merits of the underlying rationales are of first theoretical (i.e., scientific) importance and, consequently and eventually, of first practical importance. Lumsdaine[28] has suggested that "branching programs can be thought of as variations on an essentially linear sequence." Even so, there is general recognition among specialists that the two tactics represent early formulations, and that programs of the future will probably incorporate notions not earlier envisioned. The potential purchaser of a program should probably not take sides on the issue, but instead select a program on the basis of its content and evidence of its quality rather than on the basis of the programing style employed.

One practical question arising from the findings on response mode (overt required for long or difficult or complex responses, but covert just as good for short, simple, verbal responses—see Cummings and Goldstein[29]) may no longer be pertinent as the cost of printed programs begins to approximate the cost of conventional materials. The high cost of early programs requiring write-in responses led some teachers to instruct students to write responses on separate sheets of paper rather than directly in the program, so that the program could be used again with later students—a tactic that understandably saddens publishers, stockholders in publishing companies, and authors looking forward to royalties. The teacher is not ordinarily equipped to question the use of overt responding, however, and should probably have students do what the program calls for.

Can Programs Teach Anything and Everything?

Today, no! Tomorrow? More than they can today. Eventually? Still probably not. All the world's history suggests the rashness of setting any ceiling on the ingenuity of man's brain. Even within the brief ten-year history of programing, the scope of programed materials has been increasingly broadened; hardly a school subject has been left untouched. Just the same, a few presently limiting factors may be mentioned. For one thing, the potentialities of computer-based instruction aside, responses in current programs are mainly restricted to a few words or a sentence at most. We have no way, as yet, to build in model answers longer than that that the learner can be expected to be able to compare with his own response with sufficient reliability. We do not expect (in the foreseeable future) a device that will evaluate a student's 500-word theme with respect to "style," setting aside matters of the mechanics of writing. (Since disagreement among the judges of the same essay test paper is notorious, it is clear that teachers do not do a very good job of this either.) Perhaps the single greatest limiting factor in programing is, then, the size of the response unit and the furnishing of feedback for "large" responses. Just the same, these "large" tasks are comprised of many ingredients, some of which are very readily programable, e.g., the mechanics of writing (spelling, punctuation, grammar), which are in fact represented by a number of existing programs.

---

[28] *Ibid.*, p. 79.

[29] *Ibid.*, pp. 231-241.

The foregoing aside, susceptibility to programing is a matter of degree. Subject matters with an inherently logical structure (e.g., mathematics, the sciences, shorthand systems, et al.) lend themselves especially well to programing. Ethical, social, political, moral issues, which have little apparent inherent structure and in which there are often no right answers, present tricky and mostly unsolved problems—but so do they in live teaching too. The real facts of the case are that we know a good deal about the processes that underlie the acquisition of those knowledges measured in most school tests, whereas we know relatively little about the acquisition processes for the more subtle aspects of human behavior reflected in such terms as character, personality, attitudes, etc. When we know more about these facets of behavior, we may be able to program them too. (The same is true of live teaching: it remains to be demonstrated that the live teacher can do anything about these behaviors either.) And, of course, it is not easy and it probably is not even desirable to propose any particular character, personality, or set of attitudes as the ones to be aimed at, at least not in all situations.

Will Programs Replace Teachers?

No! As Skinner[30] has himself said

> We need not worry about this until there are enough teachers to go around and until the hours and energy demanded of the teacher are comparable to those in other fields of employment . . . . In assigning certain mechanizable

---

[30] Lumsdaine, *op. cit.*, pp. 112, 156.

> functions to machines, the teacher emerges in his proper role as an indispensable human being.

And Fry[31] points out that programed learning can

> . . . make possible, and practical, the regulation of the student's progress by his own ability, and offer an opportunity to banish much of the drudgery of teaching, leaving ample time for the individual teaching that every teacher wants to provide . . . . What is offered is the possibility that the teacher will be able to spend more time on the all-important task of teaching.

How May Programed Materials Be Used in Education?

A program can be used in the classroom under supervision or it can be used as homework. It can be a sole source of instruction (as it is for out-of-school adults) or an accompaniment to live instruction. The main point to be grasped is that if the program is a good one, its contents need not be repeated "live." That so much of instruction consists of the teacher stating in class what either has been or will be read in the textbook is sufficient testimony to the inefficiency of live teaching or of conventional textbooks or both. Instead, the teacher should take up where the program leaves off, teach things the program has not taught, clarify only such points as the program may not have handled adequately, "enrich" the instruction. For example, a history program on Elizabethan England might deal with Sir Walter Raleigh and his bringing of tobacco from the new world to the old, but say little more about him. The knowledgeable history teacher can add many fascinating tidbits about Sir Walter (his behavior in the Tower of London and during his trial for treason) that the programer did not elect to include in his program.

Since programing is self-instruction, it is hard to make a case for working on programs in class under supervision. If the fear is that otherwise students will not do the necessary work, then the teacher is clearly behaving in a disciplinary and monitorial, rather than instructional, role—and we do not need a college-educated professional for that. However, the teacher who cannot restrain the temptation (built in over years of teaching) to repeat in class what has been assigned, via program, as homework will soon enough teach his class not to do their programed homework and be led (through his, not the program's, fault) to the erroneous conclusion that students do not learn from programs.

The common report that students who have laid the groundwork on a topic by working through a program are then ready to go on to more advanced notions in class suggests that first the program and then class discussion may be a superior tactic to class discussion first, followed by program. If (for one or another not very impressive reason) programs are worked on in class, it may be repeated that one thing to guard against is steady, unrelieved work on programed materials. They should be used in reasonable doses, interspersed with other, nonprogramed activities.

---

[31] Fry, *op. cit.*, p. 12.

IMPLICATIONS FOR EDUCATION

Among many, two major implications will be mentioned here. For one thing, research has already shown that good programs "result in essentially zero correlation between achievement scores and an IQ measure."[32] Thus, we have to rethink our conventional notions about scholastic aptitude. Given sufficient capacity for a task, with a good program, low-ability students achieve as well as higher-ability ones. With inefficient program sequences, high-ability students do better than low-ability ones; with efficient sequences, differences disappear.

A second implication with enormous consequences arises from the learn-at-your-own-rate feature of programed instruction. Conventional curricular arrangements in which everyone, regardless of ability, spends one semester at plane geometry, say, become inappropriate and self-defeating. A revolution in administrative procedures will be required to bring about the sounder plan of making achievement, not time, the measure of readiness to proceed to something else. It is criminal waste to hold for five months the student who can master the task in three months. It is equally criminal to stop instruction after five months for students who have not by that time achieved any genuine mastery. With good programs, all who have the capacity for the task will learn, in greater or lesser time as the case may be—and this is how it should be.

Finally—and this largely explains the discussion of fairly technical issues in this chapter aimed at teachers—programed instruction is a genuine breakthrough. For the first time in the world's history, scientific findings about learning have been brought to bear on the day-by-day activities of teachers, on the world's most important business—education. If teachers are to become productive, rather than passive, partners in this exciting new enterprise, they must increase their proficiency in the language in which that enterprise is conducted.

---

[32] De Cecco, *op. cit.*, pp. 348-355.

CHAPTER 5

Television in Business Education: Today and Tomorrow

ROBERT M. DIAMOND, University of Miami, Coral Gables, Florida

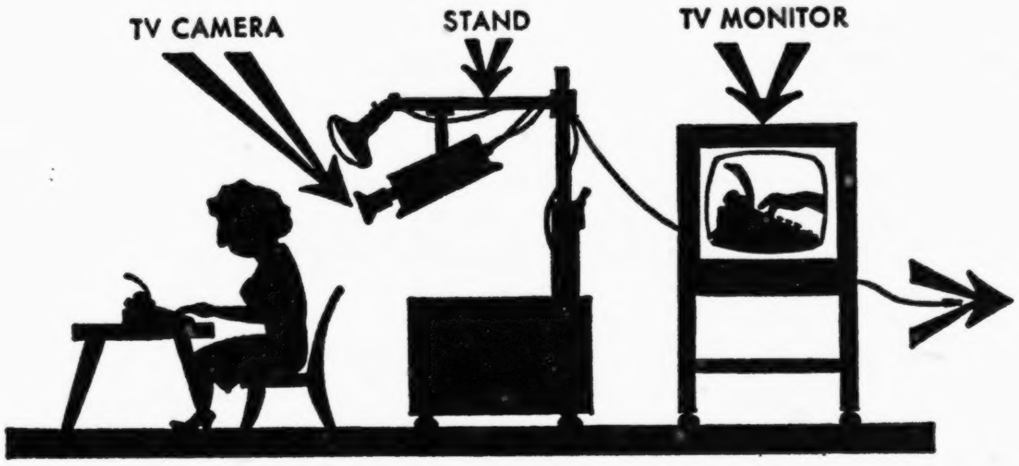
Television is only one of a series of new instructional tools available to teachers and, like the others, is only as effective as the care taken in planning and the skill of application. Unfortunately, instructional television has been oversold, misused, and often the lessons themselves have left much to be desired. Television can help in the improvement of instruction; but to do this, it must be utilized properly and well. In this chapter, an attempt will be made to place the medium into perspective while, at the same time, show how it relates specifically to business education.

SINGLE-ROOM TELEVISION

As we have explored the various applications of television for educational purposes, most of the money and, as a result, most of the interest has been centered around large-scale productions being televised into many classrooms over a wide area. These studies and experiments have all but submerged a development that may, for business education, have a much broader and practical application. This has been the use of a small, relatively inexpensive, self-contained television camera. This unit, easily operated by the instructor, can be used as a simple magnification device within the classroom without the apparatus and technical assistance usually associated with television. Thus, we have the visual benefits of television combined with the ability to instruct in the student-teacher interaction situation.

The entire unit is composed of three basic elements: camera and lens, camera stand, and television receiver. The television camera, ranging in price from $450 up and weighing from 8 to 16 pounds, is "self-contained" with all the generating equipment built within the unit itself. The camera is then directly connected to one or more television receivers (see diagram)—as many as eight have been used. The receiver or receivers can be of the standard home type, which cost the school approximately $150 for a 23″ model. When we add the cost of lenses and stand, it is possible to be in operation for less than $1500.

From experience at the University of Miami and at various other schools, we find that most instructors can master the use of this unit in a matter of minutes. The unit is portable and simple to operate. In the teaching of typewriting, for example, the camera can be focused on portions of the typewriter with monitors placed around the room allowing each student an unobstructed view.



The television camera on a stand designed to allow maximum flexibility is connected directly to one or more television receivers.

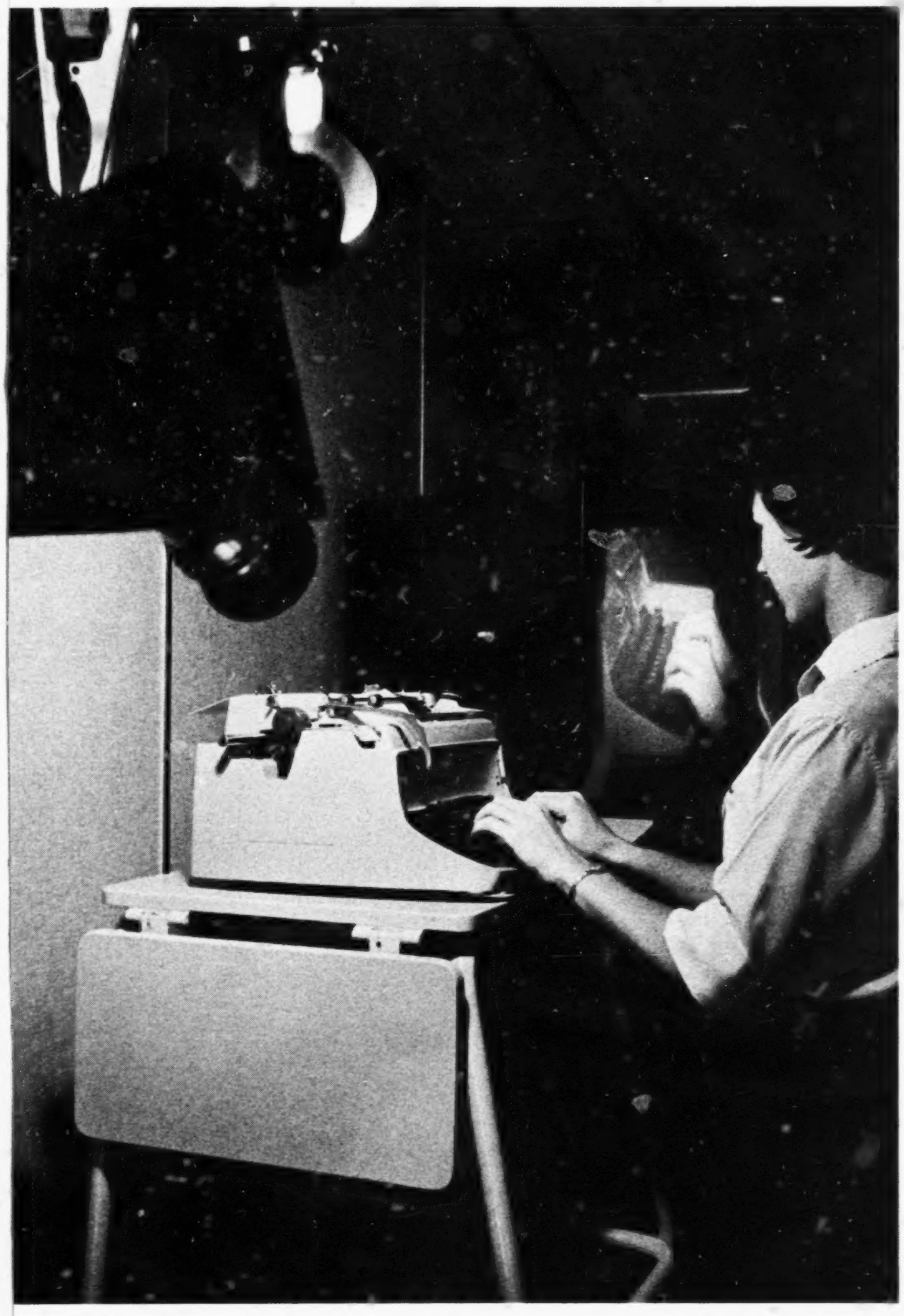
Applications

Edward E. Kelly of San Fernando State College, in a detailed article on the use of the single-room camera[1] in the teaching of typewriting, reports three basic advantages of this technique: (1) a saving of teaching time, (2) an increase in the number of students that could be taught, and (3) improvement of instruction.

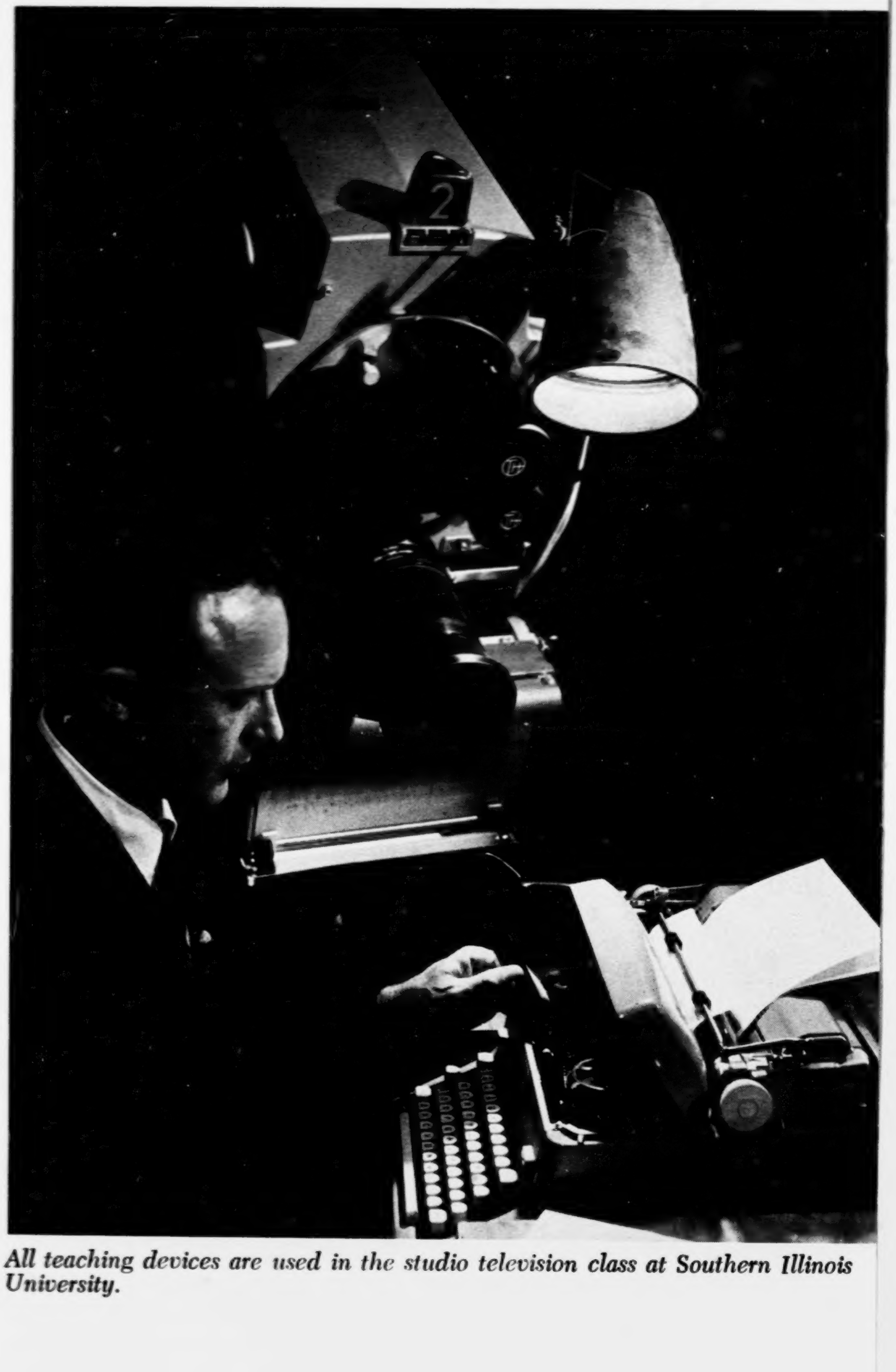
At the University of Miami (see photograph) this technique was extremely effective in the teaching of stroking. Students taking turns on the typewriter being televised were able to see for the first time their technique, and poor stroking was immediately corrected. During the in-

---

[1] Diamond, Robert M. *A Guide to Instructional Television.* New York: McGraw-Hill Book Company, 1964.



The self-contained single-room camera in use at the University of Miami.



All teaching devices are used in the studio television class at Southern Illinois University.

troductory portion of the course, individual parts of the machine could easily be identified. By this technique many demonstrations that under standard teaching technique must be repeated for small groups of students or actually omitted could not be completed with a single demonstration. As Dr. Kelly stated, it became possible to increase the number of students without undue hardship on the part of the instructor.

The techniques applied to typewriting also have immediate application in all those courses using equipment ranging from adding machines to computers. If a student has a particular problem, it is often a simple matter for the instructor to clarify the point by repeating the demonstration or pointing to a particular part of the equipment which the student can easily see on the television screen.

It should also be mentioned that this unit can often serve the purpose of both an overhead and opaque projector. It is a fairly simple process to enlarge a portion of a page or show the work of some students. Application is, of course, limited to materials where color is unimportant and where the shape of the materials being viewed correspond roughly to that of a television screen.

In summary, the single-room television camera is inexpensive, easy to operate, and has direct application in many of our courses. For the first time it allows the teacher to enlarge and transmit views of three-dimensional objects. When exploring television and the improvement of instruction, it is strongly recommended that this technique be one of the first investigated, for often we may find all the advantages of the medium combined with the instruction teaching situation at a price well within the range of practicality.

STUDIO TELEVISION

When reviewing the use of television in business education, we find that, for the most part, the majority of work has been done with lessons originating in a studio and being viewed by many students. These students may be located in many classrooms within many buildings or individually at home.

It should be mentioned that using a studio takes time and money. It has been estimated that it will, and should, take a television teacher approximately 15 to 20 hours to prepare a single lesson. When we add to this the cost of directors, cameramen, engineers, graphic artists, and other individuals directly involved with most productions, we find that we have an investment of close to 100 man hours for each presentation. When planning to utilize studio television, we should not consider reducing the number of individuals or hours involved, for this investment is not only vital but imperative if our presentations are to reach their maximum effectiveness.

This highlights a basic fact that is often overlooked by administrators and teachers first exploring the use of television. Unless there are enough students involved, it simply may not make financial sense to turn to this approach. When districts and colleges have run cost analyses on their projects, they have found, depending on the complexity of the operation, that unless there were anywhere from 250 to 800 students enrolled in a course, the use of studio television was questionable and financially impractical. When fewer students are involved, the single-room television camera can be combined with various other presentation techniques with effective results. The one exception, of course, is the televised lesson that brings to the student something that otherwise would be impossible. In many of our smaller school districts, television has been the only means by which small groups of students in scattered schools were able to receive instruction in subjects not covered by the specialization of the teachers in that particular school.

As mentioned earlier, a major problem with instructional television to date is the fact that we have not taken the time to present the best possible instruction and often we have tried to do too much of our teaching in this way. It is impossible to justify those presentations that bring to the classroom nothing that the classroom teacher could not do as well or even better. Studio television is most appropriate for that material effectively covered in the straight lecture and demonstration. Much of our teaching is dependent upon student-teacher interaction while other aspects can be completed, especially with the use of well-designed programed materials, by self-study on the part of the student.

It is vital, therefore, that as we explore the role of studio television in our classes, we not only take the time and trouble to present quality instruction but, at the same time, identify with care the role of the television lecture and the role of the classroom teacher. All too often projects have been doomed to fail before they even have begun simply because the main interest and emphasis was on the technique and not on quality education. Television is an effective tool but only for certain roles in certain classes.

Applications

When exploring the field, we find a variety of business education topics being televised. These range from general introductory series to courses in accounting, credit, insurance, typewriting, and shorthand. Programs have been produced with the cooperation of industry and business, such as the National Association of Manufacturers supported series on the character of the American business system. The interested school district or educational system can find many of the areas covered in series being distributed by the major television lending libraries.

When we compare these series with those produced in other subject fields, we find some striking dissimilarities. Most obvious, and perhaps most expected, is the emphasis on college and adult level subjects. Of the ten series listed in the 1964 catalog, *Instructional Television Library,* only two are identified as usable on the high school level and one of these is recommended for both high school and college use.

A second major difference is the emphasis on enrichment rather than complete courses. Of the ten series listed in this catalog, only one, *Introductory College Accounting,* has been designated as a course. Without exception, the other series are listed as enrichment or supplemental materials. The majority of these are limited in the number of individual lessons averaging less than 12 each and designed for a 30-minute time segment. Only the high-school typewriting series and the accounting courses have a greater number of lessons.

Most interesting is the emphasis on adult education. It is perhaps in this area more than any other where studio-produced business education is most practical on a national basis. A statistic found in the 1956-1959 report of the Chicago City Junior College television experiment[2] emphasizes this point. Here we find the two basic business education courses, shorthand and typewriting, average in credit enrollment and yet near the top in student enrollment for non-credit purposes. While these statistics are not new, they do point up one important fact; namely, there is an audience and a need for courses of this type televised into the home for the adult viewer. Of all subject areas, business education has the most direct appeal to many individuals wishing job advancement. The rewards gained from taking such a course are often obvious and immediate.

In conclusion, television should and must be considered as one of a series of instructional tools to be utilized for effective teaching. When properly used, instructional television, in its many forms and in its many applications, can assist us in becoming more efficient and effective as teachers.

---

[2] Erickson, Clifford G., and Chausow, Haymen M. *Chicago's TV College—Final Report of a Three-Year Experiment,* 1960.

PART 2

NEW INSTRUCTIONAL MEDIA APPLIED IN THE TEACHING OF BUSINESS SUBJECTS

CHAPTER 6

New Media for Teaching Shorthand

Elizabeth T. Van Derveer, Montclair State College, Upper Montclair, New Jersey

Most of the equipment to be discussed is not really new. Dictating machines, tape recorders, flash readers have been on the market for a long time. The teacher now finds this equipment much more usable—it is lighter in weight, smaller in size, and more portable. It is easier to operate, supplies are more durable, and the prepared materials are longer lasting. Also, as manufacturers have come to recognize the educational possibilities of the equipment they have for sale, new educational materials have been published and old ones refined.

Cost, a factor of extreme importance, has been reduced for many reasons including usage, manufacturing procedure, and technological advancement. Equipment, which at one time could be included in the budget of only the larger schools, is now feasible for all schools because of reductions in cost. The more affluent can now purchase in quantity rather than in single items. Furthermore, not only is such equipment in the classroom, but it is in the hands of the student. Think, for example, of student-owned tape recorders, dictating equipment, pocket radios, record players, and television sets.

As an example of improvement of supplies accompanying classroom equipment, compare the paper tape for a tape recorder of ten years ago with the mylar tape of today. Hours spent today in the preparation of dictated materials for a tape recorder or a dictating machine is time well spent. Before plastic tape, time was probably largely wasted because the paper deteriorated and broke frequently.

Another condition which is bringing not-quite-new media into the classroom almost as if it *were* new is the preparation and acquaintance of teachers with such equipment. Prior to the common use of such equipment in undergraduate and graduate classes, it was only the curious and persistent teacher who tried to secure these valuable teaching aids. The mechanical element of equipment frightens some persons. Fortunately, most companies are spending considerable effort and money to reduce the operating gadgets to a minimum and are reducing the time necessary to learn efficient operation. To verify this statement, it is only necessary to contrast an early dictating machine with its modern successor. Perhaps old equipment should be retained just to prove to students that improvements are being made.

One last explanation for the growth of interest in the "new" media is that business education in many of the newer schools is being allotted permanent teaching space. Typewriting, of course, has always been taught in a specialized room. Now, in some schools, business education is provided with a business suite with most, if not all, stenography classes taught in a "stenography" room. Although tape recorders, overhead projectors, and machine transcribing units have become more portable, it is desirable that permanent room assignment be made to the teacher who would like to or is expected to use such equipment. In the three minutes between classes, it is difficult to transport oneself, materials, and equipment from one room to another. Depending upon assistants to do this when such assistants are students rushing to their own classes has made teachers decide to teach without the benefit of equipment. For many, fortunately, this excuse is disappearing. Now is the time to make the most of the new media available.

What are the "new" media particularly useful to the teacher of shorthand and how can they be used effectively?

Multiple-Listening Outlets

Types. Many types and brands of multiple-listening outlets are on the market. The sending medium may be a tape recorder, a dictating machine, a record player, or a three-in-one console. It may feed directly, with little loss of audio, to a single outlet or to 30 or 40 headsets. Any control unit or console must be connected with an electrical line. However, audio may be supplied by electrical circuits into which headsets are plugged, by audio stripping to which headset units are attached, or by battery or transistored receiving units of which the headsets are a part.

The latter more recent development eliminates all electrical circuits, floor plugs, or audio stripping between console and headset. The console in effect thus becomes the broadcasting unit and the headset the receiving unit. (Any teacher would welcome the elimination of unsightly, unmanageable surface wiring.) In some cases a single wire runs from the console around the perimeter of the room. In other installations, there is no visible aerial. Apparently the only difficulty that may arise with this newer equipment is with overlapping broadcasts from one room to another. Sending and receiving units should be tested to be sure they are not too strong for the area to be covered. Not many schools have such equipment at the present time, but it is being demonstrated and sold. Many advertisements for these modern teaching aids appear regularly in business education magazines and will not be identified here by name.

Need. One of the major unsolved problems in teaching shorthand is helping each student achieve his best potential. Almost as soon as dictation starts, even before theory has been completed, a class tends to divide into at least three groups—those with almost photographic memory who never need to see an outline twice to remember it, and who write beautifully as well; the middle group who are slower, perhaps less imaginative, but who do rather well; and the slow group who do not have the ability for quick learning of shorthand.

Frequently, the latter group drops before the end of the year, being classified by themselves and their instructors as stenography misfits. No one really knows whether these students could make progress if they had a chance to proceed at their own pace. Some persons are trying to find out.

A room equipped with headsets and outlets, controllable by the student, now makes it possible for an enterprising teacher to direct planned practice material to each member of each group during a single period.

Use. Good equipment is used most efficiently when worked into the regular class plan. Shorthand tapes and records are available for all theory lessons, for dictation practice, and for speed development. In addition, tapes and records are available for letter, expert, and medical dictation. (Think of the possibilities of introducing specialized dictation materials to your better students.) Tapes and records have also been produced for brief form practice and special phrase practice.

Tapes may be prepared easily by the teacher and his students. For example, in addition to the commercial tape available at a certain speed for a specific lesson, the student and teacher can make tapes suitable for the special needs of those who need faster or slower dictation. Or, if it seems desirable to vary dictation patterns from the accepted one-minute spiral speedbuilding process, tapes can be prepared that provide three-minute, or five-minute takes—whatever the teacher and students decide is needed.

Probably the key to the best use of the multiple outlets is teacher-student planning. Before planning can be effective, the student as well as the teacher must be acquainted with those practice techniques which will bring about the desired improvement. The student must learn to be honest with himself and to recognize when he has been able to take the dictation and when he has not. He must recognize his ability within the class—neither with over-confidence because of his high rate of speed nor with hopelessness because of his low rate. The teacher has a considerable responsibility, whether he is in a classroom with or without equipment, to develop a realistic, hopeful, confident but not over-confident, attitude among his students.

In building the plan, each lesson must be designed so that it contains activities which will be suitable for all groups at the learning levels they can best handle. The lessons should also include practice material at the next level to which the student aspires, with easily attainable steps of faster dictation so the student can guide himself through the lesson if necessary.

Students should be allowed to make use of the equipment; they should be introduced to its use under the guidance of the teacher in the regular class period. If at all possible, students should be permitted to use the equipment during study periods or to join other classes in sessions for extra study. In a few schools, the equipment is kept in a smaller room adjoining the regular classroom—some with booths, some without booths. Students may take dictation without supervision during class periods or they may take dictation from the teacher during class periods. In any event, they are encouraged to study and do their homework with the use of the equipment. The student who prepares his homework at 60 WAM or less is bound to have trouble taking the same material at 100 WAM or better the next day. Copying from book plates is more likely to be done at about 60 or 70 words a minute at best; homework therefore becomes meaningless for real speed improvement. It merely reviews vocabulary. This the student may or may not have needed. Homework from dictated material prepares the student for the next class.

Audio equipment does not replace the teacher unless the teacher permits this to happen. He should be alert to be sure the student is following his program to his best benefit. Some students select a comfortable speed for dictation and never vary it. By listening in or by observing the dictation, the teacher will soon discover this. Some students ignore their inability to get all the dictation and are lured to the highest speeds like a trout to a fly. They too must be led to see the difficulties they may be building for themselves. Surprise transcription of some common part of the lesson is a good check on what gains have been made, if any. An occasional teacher-dictation day or other spot-checking by the teacher is desirable.

Although there is no research support for the following statement, it seems to be true that the teacher can provide as much motivation for greater effort as the taped materials. However, no teacher, no matter how experienced and capable, can give more than one dictation speed during one five-minute period. With the multiple outlets, the only limit to the variations of speed or content is the number of selection devices at the student's elbow and the number of audio devices to feed the headsets. Research probably will prove that the combination of teacher and equipment is unbeatable.

How soon should the multiple outlets be placed in use? Just as soon as the student begins to take dictation from homework materials. This should be early in the first semester. At this time, the varied dictation speed encourages the student to make the most of the early strong motivation the beginning student naturally possesses and which may be lost unless the student is constantly challenged at his own level. This is the moment to capture his interest and to lead him to making the best effort he can. This is the time also for the teacher to be released from dictation chores in order to be free to assist in the development of good penmanship, efficient handling of the notebook, good posture, and especially in instruction of the use of the audio equipment.

Choice of Equipment. The room layout and existing or planned wiring should be considered in purchasing equipment. The reproduction fidelity of the unit should be tested. While tape recorders normally have greater fidelity than dictating machines, the eventual and full use of the equipment must be considered. Is this equipment only for use in stenography? Will it be used in the teaching of machine transcription in office practice? If the equipment is to serve both needs, then the transcribing machine is the better buy.

The next decision then is associated with the recording media. Strong recommendation can be given to magnetic tape or belt. With this medium, there is no danger that what has been dictated will become so distorted with use that it must be discarded. Year after year, the dictation remains as it was heard the day it was recorded. Dictation itself is easy. To make corrections all that needs to be done is to dictate over the original area a second time. After a tape or magnetic belt has served its purpose, the whole thing may be redictated with new material. For educational purposes, there is no comparison between the effectiveness of the magnetic and the etched recording media. The magnetic is far superior.

Equipment should be purchased which the faculty members already know how to use or are willing to learn to use. Unless the faculty member who will be assigned the classes where such equipment is to be available is interested, the equipment will probably stand idle.

Use of such equipment demands intra-faculty cooperation of the highest degree if more than one individual is to use it. While the equipment is sturdy, it will last longer if used correctly. Such simple accidents as the loosening of the plug in the electric outlet is sufficient to thoroughly confuse some persons.

It will be necessary for assigned personnel to teach their students how to adjust plugs, dials, volume, and the like in order to keep the equipment in usable condition. A step-by-step description for the operation of the equipment will aid those who use it.

The Tape Library. The filing of the dictated materials is most important. Although a simple task, some persons seem to be gifted in mismanaging it. Every tape or belt or disk must be plainly labeled as to content. Also, if possible, some indication should be made to facilitate finding content in the middle of the dictation quickly. It is extremely important to rewind tape to the point of beginning after usage. If this is not done, much confusion will result as the labeling and indexing will no longer apply. Some persons suggest that tapes be recorded only on one track although most tapes are dual track. This cuts possible confusion in half.

All that is suggested here is that there be organization in the handling of supplies. Anyone who is willing to practice normal filing procedures will have no trouble. A system can be taught to anyone who is willing to learn. This includes the majority of the students. Many articles have been written describing the results of experimentation with multiple outlets. Several of these are listed in the selected references in Part 3 of this book.

Records

Most of what has been said about the use of multiple outlets and the equipment which feeds them can be applied to the record player. In fact, the record player in a combination installation becomes one of the sources of dictation. It is difficult to supplement the commercially prepared records with teacher-made records, as it is not as convenient for a teacher to make a record as it is to make a tape.

One point should be very clear: The record player is a much more common personal possession of the student than any other media. Records for homework, therefore, serve a good purpose. Records have been prepared for theory, for phrase building, and for speed development. Many students are buying their own records, individually, or in student pools. They wear well and should be a part of the library.

FLASH READING EQUIPMENT

There are at least two well-known pieces of equipment currently used for flash reading in shorthand. A third has just been announced and will also be discussed (see Programed Instruction).

The Skillbuilder

Need. Increased attention to the improvement of the teaching of reading by the use of the controlled reader led to the development of the Skillbuilder for improved teaching of office skills. As in reading, a stenography student usually must be helped to upgrade his reading response. This can be accomplished with use of the Skillbuilder which projects carefully prepared filmstrips at speeds varying from 2 to 18 lines a minute. This speed is controlled by the teacher who is thus able to coax, perhaps force, the student to faster response. However, as the student usually regards the machine as a friendly competitor, the whole experience is pleasant for both student and teacher.

Use. Excellent educational filmstrips have been produced to teach both Gregg and Pitman shorthand. These materials are correlated in vocabulary and subject matter with the shorthand textbooks.

For class use, the filmstrip is placed on the machine and fed through at a reading speed most of the class can handle. Individually, or in concert, the class reads. The same material is then again flashed on the screen for transcription, preferably at the typewriter.

Time spent on the flash equipment will vary with the purpose of the class. In general, such drill is given at the beginning of the period and should not exceed ten minutes without a break. A snappy drill at the beginning of the period for all students followed by specialized drill at speeds that forces each group to do its best is considered the best policy. (Classes again show the usual three-group division — slow, average, fast.)

During transcription at the typewriter, the teacher has an opportunity to observe the typed response. Both teacher and student should be eager to discover why the response is smooth or rough. As speeds are increased some students will reach their limit in handling the typewriter or in reading the shorthand. The student himself knows that when he begins to fall apart, he must do one of two things. He must accept this as his limit or he must work to improve his skills. He should also be able to identify which is the weakest of the skills – shorthand, typewriting, spelling, or sentence structure and punctuation. Such identification of difficulty should make remedial programs easier to plan.

Much of the work done in class with the Skillbuilder is practice work. Occasionally, it may pay to require papers to be handed in. If completely unsupervised or ungraded, some students produce sloppy work. When the student has overcome the strangeness of the procedure and is comfortable with his typewriter, it may be a good idea to ask for controlled work and grade on the basis of perfect lines. This is an accepted measurement of production. The sooner students become familiar with the real standards, the more comfortable they will be under testing conditions. It should be understood, however, that pacing for speed is not being done at the time perfect lines are requested. There should always be a difference in pacing for speed or pacing for production.

Equipment and Filmstrips. As with other equipment and materials, definite organization will make the filmstrips last longer and probably provide better care for the equipment. If at all possible, the equipment should be placed on a rolling stand which can be wheeled into place at a moment's notice. A teacher coming from another classroom probably will not use the equipment if he has to take it out of a case, set it up, and find the extension cord. The ten minutes previously suggested for drill will have been consumed by machine set-up. If the Skillbuilder is shared with typewriting classes, it would seem advisable to share week by week rather than period by period because of the time problem.

Junior equipment called Skillmate is designed for individual instruction. This sits on the student's desk and is operated by the student. Experimentation with this equipment is being conducted.

As with other equipment, the Skillbuilder is an aid and is not a replacement for the teacher. Use of the machine without understanding the learning process may hinder rather than promote student improvement. Overlong practice periods, practice without supervision, and sloppy practice can nullify the good results that might otherwise be obtained.

The Overhead Projector

Need. Business uses the overhead projector extensively for sales presentation. Stenography teachers use the chalkboard in the same way with one exception. Even though the material to be placed on the board is much the same class after class, the teacher writes this material originally for each class. If he has four classes a day, he may repeat the same board work four times. This is wasteful of time and energy.

Business not only uses a screen for projection. In some cases, the walls of the room in which the projector is to be used are white. They serve as the projection surface, thus providing floor-to-ceiling writing space. After copy has been projected, the instructor then writes in colored chalk on the walls themselves which actually are coated with a special material to make them chalkboards. The whole room then becomes projection surface and screen and board space.

For the stenography teacher, the overhead projector will eliminate much waste motion and energy. It could lead to more precise planning because the drill might have to be placed on the transparency well ahead of class time, not pulled from the text as the class gathers.

Use. The overhead projector is another piece of equipment that should be permanently stationed in the room in which the teacher will teach. The screen should be set up to minimize all "make-ready" steps prior to using the equipment.

For demonstration purposes, the overhead projector is equal to and may, with experience, surpass other media. Seated in front of the class, the teacher writes on the lined acetate sheet with a grease pencil. He makes no effort to hide the hand motion although this is done in other subject-matter areas. On the screen behind the teacher, the student sees the outline as it is written including the use of the hand. The execution of the outline is much more realistic than it is when written on the chalkboard. Vocabulary drill, notebook manipulation, and proportion drills in penmanship are only a few of the areas in which this equipment can be used to advantage. Transparencies can be prepared for all routinized drill work in the class. To do this in one school year may be difficult. However, this is a task that can be accomplished in small units as the work is covered in succeeding years.

Equipment and Supplies. The overhead projector is now completely portable and reasonable in price. It is one of the pieces of equipment which a school can afford to purchase in quantity if the teachers will use them.

Should a school have both the overhead projector and the Skillbuilder? These two pieces of equipment are somewhat alike in use, but they have more differences than similarities. The Skillbuilder automatically paces instruction. The Skillbuilder projects filmstrips which up to this time have been prepared by the manufacturers of the equipment. With the overhead projector, the teacher writes on the plate as the class watches. He may also project materials prepared from printed materials provided copyright is not violated.

Now that it is possible to make transparencies on a heat copier, the mechanics of preparation are simplified. Only the teacher's lack of imagination can hold him back. Within a few years, the file of transparencies could be considerable. The transparencies themselves can be mounted with little effort in frames. Many companies sell them; one has only to choose the make which best suits his needs.

Discussion up to this point has centered around mechanical instructional aids for the teaching of stenography. Some persons refer to such equipment as "gadgets" or "gimmicks." Impulsively bought and left unused, or improperly used, so they may be. Thoughtful consideration of school needs and thorough preparation of those who will use the equipment will assure efficient usage. Programed instruction, at least what has been done so far, is a text and not a mechanical tool. However, it should be discussed here.

Programed Instruction

Need. Stenography should be taught on an individual basis. As early as after the first lesson, there are some students for whom the next day's review of the first lesson will not be sufficient. They would benefit by repeating the first lesson and many other lessons before proceeding to the next one.

In setting a compromise to satisfy all kinds of individual learning abilities present in class, the teacher usually provides some review and then previews new material for the next day's assignment. This is an advantage to the faster learner; he gets a little review whether or not he needs it. It does not penalize seriously the average learner for he is capable of doing some learning by himself and probably has acquired sufficient discipline to make him do just that if he considers it necessary. But the poor slower learner finds himself left behind before he even starts. Yes, there is a definite need for instructional materials which would enable this student to proceed to new work as he is able, to "reinforce" his learning as he progresses.

Use. Up to this moment, with equipment and materials available, it is easier to present the theory to the class at one time. Only in adult education classes and in some private business schools do the students learn theory as they are capable of mastering it — at their own speed. But as this is being written, two persons have experimented with programed instruction in Gregg shorthand. Unfortunately, their experiments were started with the simplified edition, and at this point, there has been no revision. Probably there will be more activity along this line.

In March, 1964, IBM published a brochure entitled *IBM Research – Computer-Based Instruction* (*CBI*): *Introduction to the IBM Research Project* by A. Maher. In it was pictured a stenowriting (machine shorthand) terminal described as a special-purpose terminal used to teach stenowriting. The student is pictured seated at a stenotype machine with the terminal, about the same size as the machine, slightly to the right. Behind both pieces of equipment is a panel with two rows of "electroluminescent character formers." A word is flashed on the panel from the computerized program. The longhand appears on the panel simultaneously with the form of the keyboard. On the keyboard, the correct letters are lighted indicating correct hand position to "stenowrite" the word. The student thus has before him in reading position the longhand word, the abbreviated form, and the correct mechanical fingering.

Although this procedure is not likely to be found in classrooms in the immediate future, it has proved to have possibilities. In order to simplify composition of such teaching materials, a special language has been developed called "Coursewriter" and an interpretive computer program has been written for the language. A course to test equipment presently exists for stenowriting which includes the basic theory, abbreviations, and practice exercises.

Television

Part 3 of this book includes some references to instructional television programs for stenography. As this is such an expensive and specialized medium, it will not be discussed further here.

CONCLUSION

Much of what has been said about media for the teaching of stenography has been associated with symbol systems of shorthand. It should be noted here that any one of these media can be used with nonsymbol systems as well. (It is interesting that the computerized program is experimenting with a nonsymbol system.) Many nonsymbol systems, because of the clearly recognized need for individualized instruction, have already been placed on tape. It is possible for a student to study by himself or to follow a customized program set up by his teacher. It has been impossible in this short space to review all the try-out experiences teachers have had with the equipment and programs mentioned.

This audio console and the tape racks are part of the system at Wayne State University.

CHAPTER 7

New Media for Teaching Typewriting

Fred S. Cook, Wayne State University, Detroit, Michigan
and
Robert E. Wiper, Utah State University, Logan

Within a decade we have seen the term audiovisual replaced by multisensory aids – or new media of instruction. Today, some audiovisual departments are called "Instructional Technology Departments." Regardless of the term used, we are concerned in this discussion with materials and devices that appeal to the eye, or the ear – or both – of the learner. These include items that are primarily audio, others that are primarily visual, and a combination of the two. We are not concerned with team teaching and flexible scheduling which are often included in a discussion of the so-called "new media" of instruction.

Relatively few of these are "new" in the sense they have been discovered within the past few years. Most of these devices and materials are adaptations of previously discovered materials and machines. They are new to the extent they have been recently discovered by educational theorists working on projects subsidized by foundations.

The educational value of multi-sensory materials and devices has been concretely demonstrated through numerous research programs. No one device has been proven superior to all other media. Further, few adherents for these materials have suggested they will completely replace the classroom teacher. In fact, those who have used these devices in an educational setting have emphasized they are *only tools.* These tools can aid in effective instruction, but these tools must be used *according to a plan* to insure optimum learning.

What are some of these "new media"? Are they appropriate for use in all business subjects? Which of these media are being used by teachers of typewriting? What are some of their implications for the future in the teaching of typewriting?

Visual Devices

Strictly visual devices that are currently used in the classroom for instructional purposes include old standbys such as chalkboards, opaque, filmstrip, slide, and motion picture projectors. Newer visual devices include the overhead projector, the controlled reader, simulators, and teaching machines. Many of these items can, of course, be used with auditory output attachments. Most are quite inexpensive to purchase, easy to understand, and simple to operate. A few are very expensive, complex, and difficult to manipulate.

Auditory Devices

Some of the auditory devices include phonograph records, dictating-transcribing machines, tape recorders, FM-radio broadcasts, and more recently small radio transmitting stations for use within the classroom. None of these items can be considered "new" – but many of them have been adapted and adopted by the profession and called new. None of these items requires extensive training for effective classroom utilization.

Audiovisual Devices

Motion pictures, sound filmstrips, and television are the most commonly used devices that utilize both pictures and sound. Some of the newer simulators and more sophisticated teaching machines also employ both media. The latter are usually very expensive and difficult to learn how to use most effectively. However, inadequate preparation by the teacher can also make the use of motion pictures and television ineffective as educational tools.

Appropriate in Business Education

Most of the materials and devices enumerated have been utilized in varying degrees in the majority of business subjects. Some, of course, have been used more widely and more effectively than others.

Some of the media lend themselves more readily to a given subject than do others. For example, motion pictures, while appropriate for all subjects, seem to offer more variety and potential for general business than for shorthand. The overhead projector would also appear to have more usability in a bookkeeping class than in a business law class. Some type of voice recording equipment appears to be mandatory in shorthand, but not essential in business arithmetic. One of the reasons that one media may be more appropriate for a given subject than another media is the nature of the subject being taught. Another important reason might well be the availability of commercially prepared materials.

The reported research on each of the audiovisual devices leads the writers to the conclusion that if the instructor uses the device as a *tool* of instruction, not as a substitute for the teacher, more efficient, effective, and permanent learning will result than if the device were not used. Apparently no one device is clearly superior to all other devices in helping to teach any given business subject. The nature of the course, as well as the purpose and methods of the instructor, are determining factors — not the media.

What Are Teachers of Typewriting Using?

Not all of the following comments can be documented with reference to published materials. One of the unfortunate facts of our times is the paucity of widely circulated written descriptions of formal or action research in our field. The writers have tried on several occasions to contact a variety of sources to obtain data on "new developments" in business education, the most recent attempt being to determine the extent to which "language-type" laboratories were being used for the teaching of typewriting. The sources contacted included city and state supervisors of business education, representatives of the National Association for Business Teacher Education member schools, and contributors to yearbooks and periodicals.

An analysis of published articles would lead one to assume that relatively little is being done today in the utilization of new media of instruction in the teaching of typewriting. However, the following "highlights" from reading, visiting schools, and talking to other business teachers indicate that teachers of typewriting are experimenting with and adopting various media in their daily presentations. Here are a few that you might want to learn more about:

Chalkboard. Cleo Casady's article and film on using the chalkboard instead of a textbook for teaching the keyboard.

Mirror. A teacher in California had a mirror mounted above her typewriter demonstration stand (the same idea as a mirror above a "piano bar"). All students could see her hand and finger position as she demonstrated stroking.

Opaque Projector. Another teacher used the projector to show the students good points and problems on their papers.

Filmstrip Projector. Commercial materials are currently available which enable the teacher to project new key presentations on the screen (accompanied by a professionally recorded narration).

Slide Projectors. Several teachers have developed a series of slides to show the specific steps in changing a ribbon. This enables the teacher to show the students a closeup of the ribbon carrier, for example.

Motion Picture Projectors. There are at least two films available that describe a technique for the presentation of the alphabetic keys. One of these was developed by Cleo Casady, Wisconsin State University, Superior. There are other commercially prepared films that aid the teacher in presenting specific drills and techniques. In addition, there are some kinescopes that can be borrowed which show portions of lessons that have been televised.

Overhead Projector. A teacher in Michigan prepared transparencies for introducing the keyboard when she was asked to teach a class of 100 students. This device has also been used effectively to illustrate centering and arrangement problems.

Controlled Reader. The tachistoscope, used by Fred Winger in his doctoral experiment, was effective in developing typewriting skills. Several studies at the master's and doctoral levels have been conducted utilizing the controlled reader materials developed by Robert Ruegg for Educational Development Laboratories—this device has received considerable use and attention, not only in typewriting but in other business education courses.

Simulators. Simulators are used extensively in military training. The Link Trainer for pilots is the best-known example. One typewriter manufacturer is currently promoting a special keyboard arrangement which is called a "simulator." The manufacturer claims this device will enable a person to learn how to operate a keypunch machine more readily. No research evidence is available to substantiate this claim.

One of the authors used a simulator that had the appearance of an IBM keypunch machine. This simulator was electronically programed. It is possible to teach a person to keypunch without the aid of a teacher. The inventor stated that it would be a simple matter to use a typewriter keyboard, instead of a keypunch, and to program the machine to teach a person how to type by touch.

Teaching Machines. The simplest of these devices are mechanically operated and require the person to write his answer with a pencil. The most sophisticated, and the ones that we will be using more extensively in the future, are "tied" to a computer and have audio or mechanical interrogator units. These interrogator units are used by the student to communicate with the computer.

The McGraw-Edison Company has manufactured a teaching machine that enables the student to learn to read and typewrite concurrently. This machine is preprogramed. The keyboard locks if the student does not type the correct word or sentence. The material to be typed is given to the student by an audio output, or by a visual item on a screen. When the correct word or sentence is typed—the machine repeats *orally* the material that has been typed. The Westinghouse Corporation has also developed a talking typewriter. These items cost ten to thirty thousand dollars at the present time.

Engineers at Stanford University have developed a computer that can be programed by oral input. A person can teach the computer, by repeatedly spelling and pronouncing a word, a vocabulary of 100 words in one hour. Sentences can be dictated orally to this computer by using the vocabulary that has been orally programed. The computer will reproduce perfectly typewritten copy.

IBM has produced an optical scanning system that converts notes from a Stenotype machine into typewritten copy. They have also combined a Selectric typewriter and an audio tape device that provides the opportunity to edit typewritten copy as easily as one can now edit a piece of magnetic tape.

Television

Probably more experimentation has been done with the teaching of typewriting by television than with any other business subject. William Pasewark's study in 1955 provided objective data on the possibility and feasibility of teaching touch typewriting by this media. Since that time many districts have experimented with both open- and closed-circuit telecasting. Effective utilization of TV typewriting programs could revolutionize the teaching of this subject. We may someday have a set of videotapes or kinescopes on the major skillbuilding and techniques procedures (taught by experts) or even a complete introductory typewriting course that could materially affect the need for a battery of typing teachers in a large school system.

While not all of the items mentioned are being used uniformly or extensively in many cases, they are items that will be found in typewriting classrooms today. Several of these items have been with us for a long time and have not been properly exploited. Others are obviously in the experimental stage and may not have the expected impact for the future of typewriting instruction.

Audio Laboratory Facilities

One of the least sophisticated and least expensive concepts of the utilization of "new media" of instruction in the teaching of typewriting is the language laboratory approach. The teaching of foreign languages has been immeasurably influenced by the use of audio devices in language laboratories that utilize batteries of tape recorders. These ideas and materials have been modified and adapted to the teaching of shorthand and typewriting. While it is true that more has been done with audio laboratories in shorthand than with typewriting, there is serious thought being given to this idea in various school systems. Most of those contacted were developing laboratories that can be used for both purposes.

AUDIO-MEDIA IN TYPEWRITING

Audio-media for use in the business education classroom are expanding at an ever-increased rate. Magnetic tapes, records and belts, wax records and belts, and even voice-actuated equipment provide a means of "input" for individualized one-channel communication with students. In some cases the students may respond over a second channel to questions and challenges presented to them. The end result is more adequate provision for individual differences. For years, instructors have been concerned with individual, group, and total classroom learning. Enterprising teachers have designed and installed various devices to stimulate student readiness for learning at various instructional levels. Small distributors of audio equipment have given their efforts and time in developing the "ideal" audio-monaural classroom. Larger manufacturers have spent thousands of dollars in researching, developing, and manufacturing component and total audio installations for the classrooms of today. Some are quite inexpensive while others are more costly.

College Typewriting Laboratories

Recently, the Department of Business Education at Utah State University solicited information from various colleges and universities and from business education authorities to help determine the scope, depth, and impact of audio-media on business education. One of the respondents, Carl Salser, Portland, Oregon, summed up the probable effects in saying:

> It probably is true, as has been suggested from many quarters, that the field of business education badly needs a "sputnik" or a "bomb." The jarring effect of such as these can cause a most beneficial reaction within the fields directly concerned. Certainly this has happened to mathematics, science, and foreign language—and would that it might happen to our chosen field. . . . For nearly three years, we have been working with a special Electronic Console Operative System (ECOS). At first its application, as you know, was limited almost entirely to the field of typewriting. Gradually, however, we have expanded these monitor instruction programs to include not only typewriting and shorthand, but business correspondence, personality and human relations, medical-dental lectures, business law, and many other subjects. . . . Unfortunately, many teachers, though intrigued, are frightened by the system, seeing it as a threat to their positions, rather than an *emancipation from routine,* which, in fact, it is. We believe that the "routine" phases of teaching are an enervating drag on creative teaching and that the proper deployment of machines can relieve and release teachers for the more inspired and inspiring aspects of teaching. . . . As a matter of fact (and, indeed, we are working in this direction), it is our feeling that the "wiring" of electronic instruction units will be passé and that a free transmission environment will be devised before long, providing "instant" instruction in a variety of subject-matter areas.

So much is being done with audio-monaural installations in typewriting, shorthand, and business machines classrooms that other audio approaches to teaching are often overlooked. As an example, Rich Engineering Incorporated has developed a "Stenomatic" typewriting laboratory. This system provides for student instruction through three cartridge tape recorders and one 4-speed phonograph. The unique feature of the "Stenomatic" system is that each stroke of the student's typewriter transmits a signal to the instructor's console where by means of an electronic speedometer, the student's typewriting speed in words-a-minute is immediately known. In addition, while monitoring, the teacher may record by means of a stylus graph, the student's total typewriting performance, which includes speed, rhythm, and consistency.

The McGraw-Edison Company recently announced the introduction of the "Serenader" to the voice-writing field. This transcribing machine provides for a personally-controlled background music system for transcribers of dictated material. The secretary uses a special Edison Music/Dictation Listening Device that blends background music (nonvocal) and the dictator's voice. The transcriber in this way is allowed the enjoyment of background music, which is normally denied to the use of headsets, and in turn produces transcripts at supposed higher rates of speed.

Of the audio installations designed and installed in business education classrooms throughout the country, there are several college laboratories which seem to encompass those "ideals" that many are looking for in such installations. Among the schools are: Bowling Green State University, Foothill College (Los Altos, California), Oregon State University, Pacific Business College (Portland, Oregon), University of Wisconsin, Utah State University, and Wayne State University (Detroit, Michigan). Each installation is unique within itself—running from simple to very complex designs. Flexibility is the intent of each installation, however, allowing for versatility and individual teacher-student contact.

One of the most complex and sophisticated systems is still in the installation stage at Utah State University. This system provides for a self-teaching laboratory in which a 9-channel, wired, reel-to-reel tape deck console is utilized. The instructor has contact, through a microphone, with a single group of students or the entire classroom.

An oscillograph will be utilized by single-machine (electric) voltage response, to record stroking patterns of each student in the laboratory. The graphs will then be compared (somewhat like an electrocardiogram) so that the "norms" may be established for more acceptable patterns. Use of high-speed, automatic rewind mechanisms in the tape decks will also permit the self-teaching of shorthand, business machines, business law, business English, and other courses simultaneously in the "open" laboratory each afternoon. Microphones will be employed at eight desks for student response and for magnetic recording of student-typewriter/office machine stroking patterns.

Two other rooms will also become audio-monaural laboratories in this system. Both of these rooms will utilize a "wireless" system with "perimeter" pickup so that an FCC license will not be required. Each student will have a 3-channel receiver at his desk and a headset. The instructor will have a wireless microphone for working with the students and overriding programs and a wireless headset to pick up the programs being played on the three channels. Both rooms will have remote controls so that the master console can be activated in the self-teaching laboratory without entering that room.

It is the intent of this system to employ complete flexibility for individualized instruction, on the remedial as well as the superior learning level. It will be possible to have three classrooms using the nine channels at one time. For instance, a typewriting class in one room may be using the first three channels on accuracy, speed, and pacing drill work; at the same time a shorthand class in another room may be drilling on material geared for the remedial—40-60 WAM, average—60-80 WAM and superior—80-100 WAM students from the fourth, fifth, and sixth channels; a business machines class in a third room may utilize channels seven, eight, and nine for personalized instruction on the 10-key printing calculator, rotary calculator, and bookkeeping machines. This is indeed a sophisticated system, but it is designed for forward-looking business instructors.

High School Typewriting Laboratories

The only published material for a high school typewriting laboratory is contained in an article by Agnes Schellstede, of Tulsa, Oklahoma. This article describes in detail the philosophy, content, and results of teaching typewriting with audio devices. In a letter[2] to a graduate student at Wayne State University, Mrs. Schellstede further emphasized the effectiveness of the laboratory:

> I have a set of professional drill tapes that I use for all drill other than drill to music. . . . These tapes stress both accuracy and speed.
>
> We taped the first 65 lessons in our textbook. We are using the 191 Series of Gregg Typing and followed to the letter the instructions given by Dr.

---

[1] Schellstede, Agnes. "Teaching Typing with Tapes." *Business Education World*, April 1964.

[2] Letter dated May 18, 1964, to Faustine Niszczak.

> Lloyd. The tape does not "repeat" instructions, therefore the students *must* listen and concentrate on the instructions given on the tape. The teacher is free to move about helping the students to obtain correct posture, hand position, and also rhythm. She can help each student individually without stopping the entire class.
>
> At the beginning of school when there are a great number of schedule changes, the tapes are wonderful for the student who enrolls a few days late. Should a student feel the need of repeating a lesson more than one time, all that the teacher need do is to have that lesson on one of the recorders and the student can repeat it without interfering with the progress of the other students. Twice as much teaching can be done by using the tapes. The secret of using this kind of set-up is to get control of the students the first day of class. I presume that typing is an elective in your school. That in itself is a hold on the student—he is there because he requested it and therefore he is there to learn.
>
> It is most important that you have a raised platform for a class this large. The platform that I have in my room is about 12″ high. If you have more than 75 students in one room, you should probably have a platform about 15″ high. It cost about $1800.00 to wire the room.
>
> This last year we used the overhead projector to teach the keyboard. The student did not see a textbook until all the keyboard had been presented. In this way the student had better posture, hand position, and also kept his eyes on the copy in the front of the room.

An unusual use of a short-wave training device was observed at the Melbourne High School, Melbourne, Florida. This school operates on the concept of an ungraded school and among other innovations it uses large-group instruction. The typing teacher has a classroom containing 125 typewriters; she teaches five classes a day, or a total of 625 students.

Voice projection in a class of this size could be a problem. The administration has provided the teacher with a wireless microphone which provides complete freedom of movement around the classroom. This is essentially a short-wave broadcasting station. We observed it in operation and felt it was quite effective. This is another example of an electromechanical device that will directly influence the future role of the typewriting teacher.

A Business Office Typewriting Laboratory

The First National City Bank of New York[3] has recently installed a set of short-wave training stations for the use of typists and stenographers. The equipment consists of a sending console and 20 receiving sets. Each receiving set can accommodate two students. The bank has plans to install another 3-channel transmitting console, as well as an additional 20 receivers next year.

---

[3] *Number 8 News.* New York: First National City Bank, August 1964.

Several advantages of this type of equipment, according to the teacher, are:

1. The students using the receivers are better able to concentrate on their work.
2. The three channels provide for more variety.
3. The console can be placed in a room apart from the typewriting stations and thus provide more space in the training center.

The equipment used in this installation has been demonstrated at recent business education conventions.

CONCLUSIONS

Business education literature would lead a casual observer to conclude that relatively little is being done today in the utilization of tapes and records (language-type laboratories) in the teaching of typewriting. An exhaustive survey of the literature revealed, for example, only 22 articles[4] that might have some implications for the use of these items in the typewriting classroom. Subsequent follow-up letters to a number of authors secured only minimal additional data.

Another recent survey to determine the use of new media revealed a similar lack of published information about the utilization of new materials in business education. Sources contacted included city and state supervisors, all NABTE-member schools, and selected authors.[5] However, the survey did indicate a number of schools were using or planning to use new media in their business education department. Many more, in fact, than had been surmised through a review of the literature.

A total of 357 business educators were contacted and replies were received from 193, or 54 percent. Out of these replies, we found the following utilization of new media—or new methods in teaching subjects:

	Cities	*States*
Dictation labs	99	35
Television (open and closed circuit)	64	29
Team teaching	56	30
Large group instruction (primarily in typewriting)	42	26
Programed texts	41	19
Flexible scheduling	30	18
Teaching machines (including such devices as overhead projectors and EDL equipment)	20	12

---

[4] Niszczak, Faustine. Unpublished study. Detroit: Wayne State University.

[5] Brown, Daniel. Unpublished study. Detroit: Wayne State University.

Business teachers in many communities are aware of and are using the new media. Few business teachers, however, have written about their experiences. Furthermore, it is difficult to find research studies directly concerned with the teaching of typewriting via these new media. There is a definite need for business teachers not only to use, but also to do research about the advantages and limitations of new machines and materials in the teaching of typewriting.

New media and methods of instruction are here to stay. When used effectively, they have demonstrated that we can teach more in less time and do it more efficiently. Within the next decade refinements in existing media, especially in the machines, will provide even more impetus for the classroom teacher to utilize these tools that increase her effectiveness.

In certain situations, audiovisual devices will be utilized to reduce the number of teachers of typewriting and shorthand. In other situations, efforts will be made to supplant the typewriting teacher with electromechanical devices. For example, some of the computer-oriented typewriting equipment is very expensive today. However, miniaturization and mass production, or new technological discoveries, can materially alter the situation in a very short time. Specifically, closed-circuit television, plus electric-mechanical control devices on a typewriter, can make the copying, skill-oriented teacher of typewriting obsolete. Concurrently, there will be additional discoveries that will reduce the need for typists. These will include voice-operated typewriting devices and optical scanning.

The typewriting teacher of the future will utilize a variety of tools that will take his place in teaching the mechanical skills of typewriting. The teacher of the future will develop and utilize materials that emphasize using the typewriter as a writing tool—in place of the pencil. His role will be to present to the students a variety of communication problems. He will help the students acquire skills and techniques for solving these communication problems at the typewriter. He will be more concerned with the content of the answer than the speed with which the answer was written.

Teachers are more important than machines, but teachers must know how to operate the machines. You must be more than a *mechanical* teacher or you may be replaced by machines.

CHAPTER 8

New Media for Teaching Bookkeeping and Accounting

VERNON A. MUSSELMAN, University of Kentucky, Lexington
and
RUSSELL A. JOHNSTON, Richmond Professional Institute, Richmond, Virginia

Teachers have demonstrated repeatedly that the new instructional media can be used effectively in bookkeeping and accounting classes. The types of teaching and learning that take place are ideally suited to the utilization of all types of new media.

The changes that are taking place in education today have to do with organization, course content, teaching method, student motivation, classroom facilities, and staff utilization. This discussion of the use of new media in teaching bookkeeping and accounting touches upon each of these phases of education.

Likewise those phases of classroom teaching that are receiving new emphasis today are a greater awareness on the part of teachers of their specific objectives and the principles of effective learning, creativity in teaching, reinforcement, meeting individual differences, and flexibility in teaching procedures. All of these are dealt with in this discussion also. The presentation in this chapter is organized around three major topics: background or setting for the problem, a description of current practices, and considerations for the future.

THE SETTING

Regardless of the worth of any single method, teaching is most effective when it is varied. The teaching of accounting principles inherently involves the use of a variety of teacher and student activities. The most important of these teaching-learning activities are explanations, demonstrations, student responses (questions and answers), problem solving, laboratory practice, verification of solutions, reviews, and examinations.

The subject-matter content is likewise quite varied. The textbook is of special significance in a bookkeeping class because it contains explanations of accounting principles, definitions of essential terms, illustrative problems and their solutions, review questions, and assignments. This means that reading for comprehension is a central part of the content of a bookkeeping or accounting class; all accounting problems inherently require the use of figures and simple arithmetic processes. Thus computation is a second important part of the course content. Because problem solutions must be written legibly, handwriting of words and Arabic numerals is ever present.

In addition, an understanding of many business and economic terms is basic in bookkeeping and accounting classes. Wayne House[1] reported that in one of the early chapters of a high school bookkeeping textbook, there were 33 technical business terms which normally are not a part of the typical high school tenth-grader's working vocabulary. Accounting terminology, then, constitutes a significant part of the course content.

The last major segment of course content actually forms the heart of the program, namely, the mastery of accounting principles. Mastery includes learning the principles or rules, and understanding how they may be applied in problem situations.

This wide variety, present both in the teaching methods and in course content, makes it possible to utilize all of the new instructional media effectively in bookkeeping and accounting classes. Let us now give our attention to a survey of techniques and procedures currently being practiced in selected high schools and colleges.

A SURVEY OF CURRENT PRACTICES

Examples of the effective utilization of new instructional media in bookkeeping and accounting classes are numerous. Many uses are so economical they can be employed in every school in the nation. It is good to see that more and more teachers are beginning to realize the great potential of these new media.

Traditional Visuals

Let us review first some of the most commonly used teaching visuals—posters, charts, blown-up forms, and cardboard headings for using the chalkboard. Although these visuals have been in existence for a long time, they can now be considered useful in a new way—as part of a total system that integrates many of the old with the newer media. For example, visuals may be used in conjunction with large-group instruction;

---

[1] House, F. Wayne. *Factors Affecting Student Achievement in Beginning Bookkeeping in the High School.* Delta Pi Epsilon Research Award Series, 1951. Stillwater, Okla.: Oklahoma State University, 1953.

they can be used to accompany television instruction. Or for a change of pace they can be used alongside the overhead projector. For this reason, any discussion of new media would seem incomplete if traditional visuals were not included.

The Poster. One of the earliest used teaching visuals is the poster. Today very effective use can still be made of the well thought out and properly designed poster. The poster must be correctly laid out and attractively done if it is to create and retain student interest. Color can be of considerable importance and it has been used to make identification of the various accounts easier for students. When teaching the meaning of the terms *debit* and *credit*, a poster showing two hands may be made quickly – label the left hand "debit" and the right hand "credit." When business transactions are being recorded, another simple poster has been found helpful in keeping the rules of debit and credit before the class. This poster is labeled "The Rules of Debit and Credit in a Nutshell." To make the poster, draw the outline of a nut and insert the following copy:

$$\frac{\text{Assets}}{+ \mid -} = \frac{\text{Liab.}}{- \mid +} + \frac{\text{Prop.}}{- \mid +}$$

Blown-up Forms. When the end-of-cycle work is being presented, teachers usually work sample problems on the chalkboard. The proper form and rulings for the worksheet, balance sheet, and income statement are essential. To avoid having to rerule the chalkboard continually, teachers have found it advantageous to have these forms ruled permanently on a window shade type of roller, on charts, or on slate cloth. When a particular form is needed the chart is pulled down from its permanent mounting above the chalkboard.

Cardboard Headings. When the chalkboard is used for demonstration problems, time may be saved by having the headings for the forms to be used printed on strips of cardboard which may be mounted just above the top of the chalkboard. For example, the headings for use in connection with a three-column Cash Receipts Journal would look like this:

Date	Account Title	Explanation	Cash Debit	Accounts Receivable Credit	General Credit

Such strip headings are easier to read than those written on the chalkboard itself; they are more attractive, they save class time, and save chalkboard space that may be used for recording entries. By cutting the strips into convenient lengths and taping them together end-to-end so they overlap, storage space is kept at a minimum.

Films and Filmstrips

There are a few films that have been prepared for use in bookkeeping and accounting classes. One excellent film for use during the first week of a first-year high school bookkeeping course is the film, *Bookkeeping and You.*[2] It is one reel in length and illustrates the different uses of bookkeeping knowledge, by depicting different members of the class and their reasons for studying bookkeeping.

An excellent film for use in a college accounting class or a second-year course in high school is *Accounting–The Language of Business.*[3] It describes selected case stories of ways that accountants serve individuals, institutions, and businesses.

A number of filmstrips have been produced for teaching various aspects of accounting principles and procedures. A series of three strips planned for use at the high school level may be purchased from the Society for Visual Education.[4] The titles of the strips in this series are:

Bookkeeping Cycle. Part 1—Recording and Posting the Opening Entry
Bookkeeping Cycle. Part 2—Recording Transactions in the Journal, Posting to the Ledger, and Preparing a Trial Balance
Bookkeeping Cycle. Part 3—Work at the Close of the Fiscal Period

The McGraw-Hill Text-Film Division[5] has a series of filmstrips intended for use in high school classes. The series includes these titles:

Bookkeeping Equation and Balance Sheet
Use of Accounts and Analysis of Transactions
Journalizing and Posting
Preparing the Trial Balance
Preparation of Work Sheet and Financial Statement
Closing Entries

Overhead Projector

Another of the new media which has been available for some time but which is still not employed very extensively is the overhead projector. Transparencies are available for purchase illustrating the various forms

---

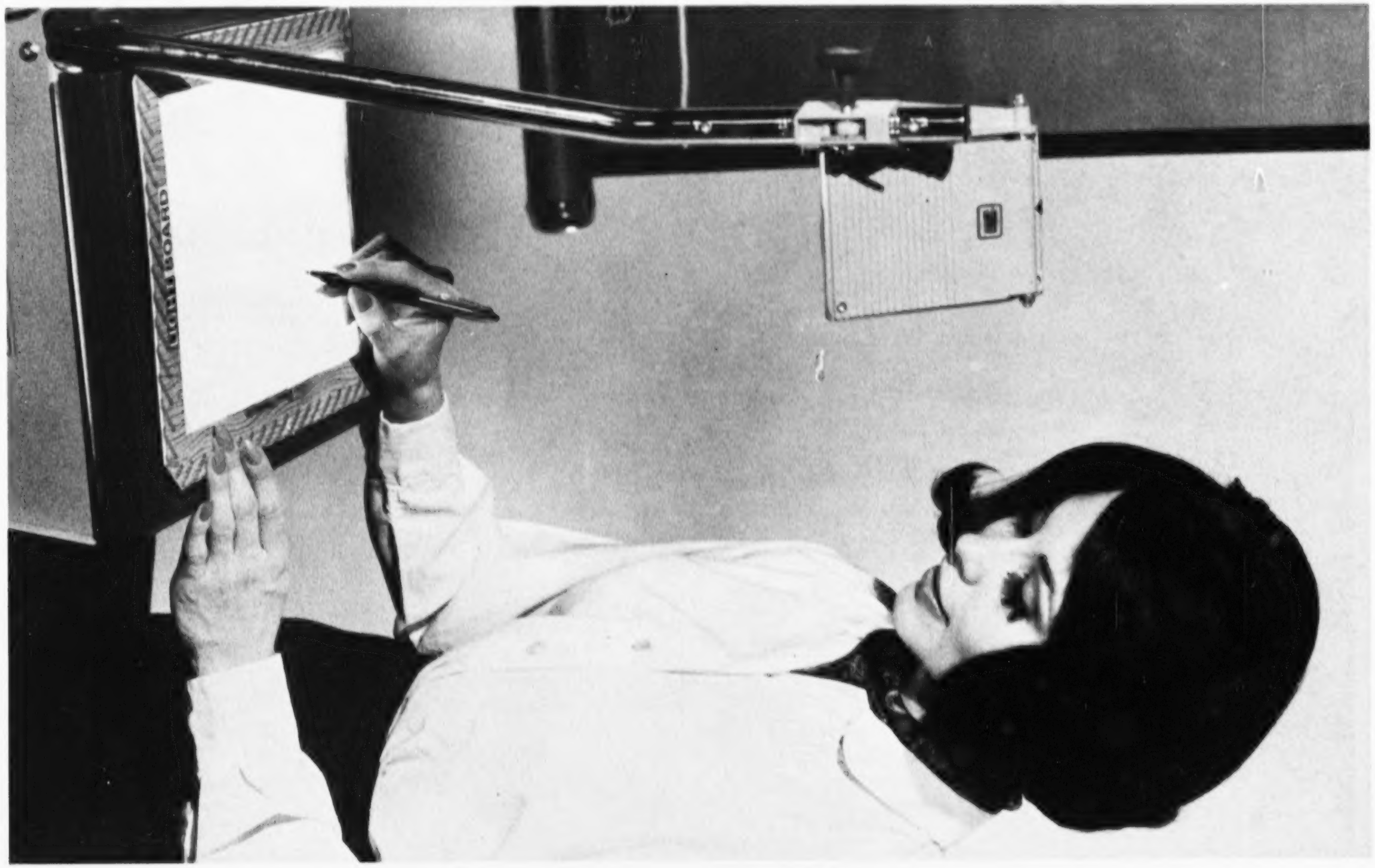
[2] *Bookkeeping and You.* 11 min., 16mm, sound, b & w. Coronet Films, 655 S. Water St., Chicago 1, Ill.

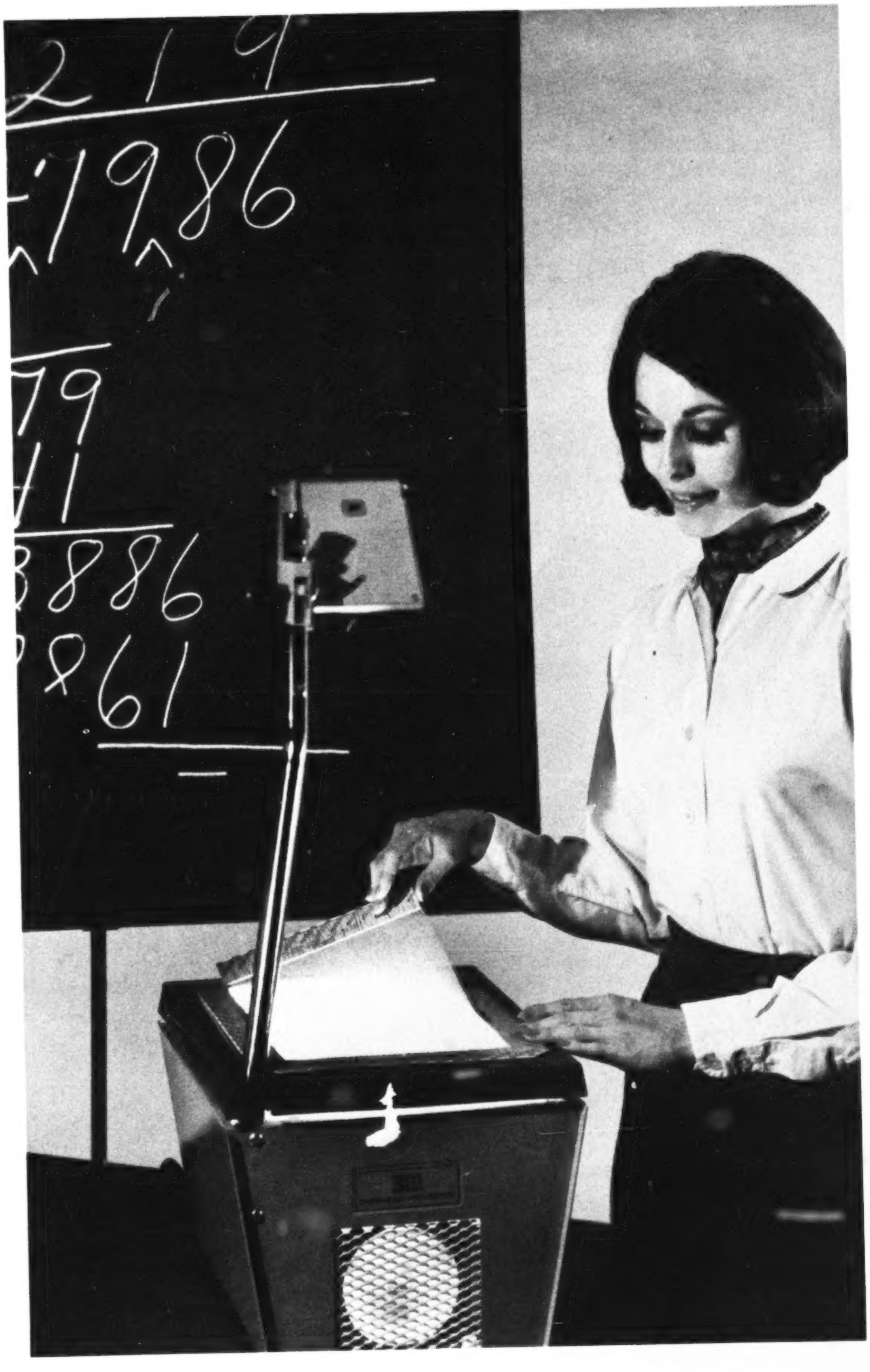
[3] *Accounting—the Language of Business.* 2 reels. Institute for Accounting.

[4] Society for Visual Education, Inc., 1345 W. Diversey Parkway, Chicago 14, Illinois.

[5] Text-Film Division, McGraw-Hill Book Company, 330 West 42nd Street, New York 36, New York.

The simple impression of a stylus on the film of this lightboard, resting on an overhead projector, makes a white image against a gray background on the screen. The image can be erased by lifting the upper layer of the film.





Photograph from 3M Company.

used in accounting classes: journals, ledgers, worksheets, financial statements, etc. Or a person may prepare his own transparencies by using a standard copying machine and the proper transparent materials.

One of the most useful methods is that of using overlays. In illustrating the worksheet for example, the first form might show only the account titles and figures that appear on the trial balance. The second overlay would add the two adjusting entry columns. The next would include the two columns for the adjusted trial balance, and so on until all money columns and their totals are visible. The final overlay would complete the picture by adding the net profit in its proper places and the final totals and proper rulings.

One of the reasons that the overhead projector is an excellent teaching medium is that the image projected can be seen quite well without darkening the room. Thus students can continue their work, and in fact are encouraged to do the same work at their seats as that done by the instructor while he is using the projector. This serves the dual purpose of providing for active pupil participation (rather than passive) and leaving the students with copies of the problem solutions which they can use for future reference.

Another important reason for the excellence of the overhead projector as a teaching medium is that the teacher-demonstrator may face the students during the class presentation. This position enables him to receive feedback and to overtly reinforce desirable responses. Such interchange between the teacher and the learner helps to minimize the student's role as a passive receiver of instruction.

The overhead projector appears to hold great promise for future teachers of bookkeeping and accounting. It is almost as versatile as the chalkboard yet it does not leave one's hands and clothes soiled as usually happens when one works at the chalkboard. It is good when using color to focus attention on special points being illustrated. Some of the newer models are light enough to be considered really "portable" and can be easily carried with one hand.

Auto-Instruction

Nearly two thousand years ago a gentleman named Quintilian wrote what one might call a handbook for teachers. In this ancient book is some advice which can serve as a point of departure for a discussion of auto-instruction and its potential uses. Quintilian told his readers not to neglect the *individual* student but to question him and to praise him. He felt the student should be made to strive for knowledge, but that the materials should be so arranged that he could gain it without frustration.

For a long time many bookkeeping and accounting teachers have sought Quintilian's goals of individual instruction. They have tried to reach the student, to encourage him, and to explain things to him individually. Teachers do not want to lock-step all students together day after day on the same bookkeeping problem. On the contrary, teachers of bookkeeping and accounting want a practical method that will permit each student to learn as much as he can and to do so at his own pace.

Quintilian was concerned that the student be properly questioned and praised. Teachers know that as the student progresses step by step toward his goal, he needs to know whether or not a given response is correct. But it takes time to correct and return bookkeeping problems. However, the constant feedback inherent in auto-instruction immediately reinforces the student as he is "praised" for correct responses, or is caused to "question" incorrect ones.

Auto-instruction, the term currently used as a successor to teaching machines and programed learning, may be the answer to many of the bookkeeping teacher's contemporary problems. Even though its principle was articulated nearly two thousand years ago, it could be the most promising of all the new media.

Programed books in accounting have already been published and they are currently used in a few schools. Complete books in paperback form are available for student use in reviewing or for original learning. One publisher of college textbooks has available for supplementary use by students the first five chapters of its basic accounting textbook completely programed. This should prove most helpful to those college students who have not studied bookkeeping in high school, but who find themselves enrolled in classes with students who have studied it. It should be valuable also to students who register late and miss the first few class sessions.

As the process of programing is further improved, explanations will accompany the answers supplied even while using linear programing techniques. There is some evidence based on recent experimentation that "effective branching can be introduced into a Skinnerian program."[6] When this technique is perfected, auto-instruction should become popular in bookkeeping and accounting classes.

---

[6] Schramm, Wilbur. *Programmed Instruction.* New York: The Fund for the Advancement of Education, 1962. pp. 61 and 73.

Closed-Circuit Television

The use of closed-circuit television for teaching accounting to large classes has been more popular at the college level than in the secondary schools. The reason for this is the prevalence of the lecture method in college classes. A professor may lecture to as many as 250 students as easily as to 25. And he may teach more effectively for he would have time to prepare his lectures thoroughly. He probably would employ more visuals and illustrative materials than he would with a traditional class of 30 students. His examples also are likely to be more numerous than under traditional teaching situations.

At Indiana State University (Terre Haute), closed-circuit television is used for the beginning classes in principles of accounting. The instructor has a small group of students in the telecast studio with him, and also has telephone lines running to the classrooms where other students are listening and watching.

At Pennsylvania State University, where research into the potential of television was initiated as early as 1954, classes in introductory and cost accounting are now being taught by closed-circuit television. Recently the Swiss-developed large-screen television system known as Eidophor was used in an experiment in introductory accounting to determine its effectiveness when compared with regular 24-inch television receivers. The Eidophor projector was installed in a large auditorium of 1,200 capacity where it projected a picture 11 by 14 feet while the 24-inch television receivers were located in conventional size classrooms. Tested at regular intervals and at the end of the 16-week semester, these accounting students "learned an equivalent amount under each of the two conditions."[7]

Other evaluative studies indicate almost unanimous agreement that no statistical difference in achievement exists between the performance of television students and matched control groups taught in conventional classrooms.

As the use of all the newer media becomes popular, the teaching of large classes will undoubtedly increase. What the students do not understand from attending class lectures may be mastered by supplementary instruction in the laboratory, or reviewing the material through the use of programed units, films, or filmstrips.

---

[7] Brown, James W., and Thornton, James W., Jr. *New Media in Higher Education.* Washington, D.C.: Association for Higher Education and the National Education Association, 1963. p. 52.

Teacher Aides

When professors lecture to large classes or when closed-circuit television is used for teaching accounting principles, usually teaching assistants are employed for the laboratory sections. Selected rooms are set aside during certain periods of the day where students may work on their problem assignments. Laboratory assistants are present to assist students on an individual basis.

Although the use of teacher aides has been most popular at the college level, it has great promise at the secondary school level. This is spelled out more fully later in the third section of this chapter where our "dreams" have been written down in the form of specific proposals. The teacher aide may be a person with some college preparation or an advanced high school student.

IN THE SCHOOLS OF THE FUTURE!

Let us dream together a little. We are living in a world undergoing rapid transition and one which threatens to be dominated by change. Are the methods of teaching bookkeeping and accounting keeping pace with this change? Are the methods of teaching even keeping pace with technological changes occurring in the processing of bookkeeping data? We think not!

We should like to propose that these very advances being made in the processing of financial information must be accompanied by similar advances in the education of future bookkeepers and accountants. What is needed are techniques of education that are in keeping with the changes taking place in the subject matter taught!

Even though we shall be "dreaming," let us also be practical. Let us set forth only those proposals that have good promise of working. The suggestions outlined here may be new to many readers but actually they are, for the most part, adaptations of ideas and procedures that have already proved feasible in other subject areas.

The Use of Auto-Instruction

The programing of an entire course in book form requires many pages — approximately three or four times as many as the traditional textbook. It is expensive. Also, many elements of accounting are explained quite simply and clearly in traditional textbooks.

It is suggested that the greatest contribution that auto-instruction can make to the teaching of bookkeeping and accounting is in the form of programed materials for selected unit topics, or even portions of topics.

Specific recommendations might include the topics of accruals, reversing entries, and the so-called income tax method of recording the purchase of fixed assets where trade-ins are involved. Already several teachers at both the secondary and college levels have had some experience with "home-made" programed units or partial units, and secured satisfactory results with them.

Not to be overlooked is the fact that the creation of programs is a remarkably effective tool for "training" the teacher. The experience of organizing and analyzing material in a logical manner should be the function of all effective teachers. Few do it well. Those who cannot may be the ones who have the greatest fear of "being replaced by a machine." There will be more programing by individual teachers in the future as they seek to meet the needs of their students in difficult problem areas and to improve their own power to organize materials.

Utilization of Student Keys

Programed learning has focused renewed attention upon the principle of reinforcement in learning. We have said that reinforcement is most effective when there is immediate feedback; then, there is no wait of several days until the teacher can "mark papers at his convenience" and return them to the students.

If this be true, and if we further subscribe to the doctrine that schools should teach students to accept *responsibility*, then why should the teacher mark bookkeeping assignments at all? A "pony for the teacher" has been acceptable for many years. Why not make a book containing correct solutions to problems readily available to students?

Experience with automatic instruction materials has shown that students do not cheat just because the answers are available. It is only when the results are to be "graded" that the incentive to cheat appears.

Since we already give lip service to the idea that these are "practice exercises," why not go all the way and make them just that? Grades would not be determined by student accomplishment on practice material, and students would check their solutions against the key themselves.

Using the Long-Period Class

Experiments in staff utilization support the thesis that students' schedules should be flexible; short periods on some days and relatively long periods on other days,[8] depending on the tasks to be undertaken. Since this seems highly desirable for laboratory courses such as the physical and biological sciences, why not for bookkeeping and accounting? It is recommended that the student be scheduled for laboratory practice immediately following the formal class sessions. When this is not feasible, class lectures may be scheduled for class periods of normal length and laboratory sessions scheduled for longer blocks of time later in the day or on succeeding days.

---

[8] Trump, J. Lloyd, and Baynham, Dorsey. *Focus on Change—Guide to Better Schools.* Chicago: Rand McNally & Company, 1961. pp. 117-119.

Employing Teacher Aides

A well-prepared teacher of accounting should be freed of time-consuming routine tasks — recordkeeping, custody of supplementary materials and teaching aids such as filmstrips, checking problem solutions, auditing practice sets, and preparing charts or transparencies. At the college level the aide may be a graduate assistant or an upper division undergraduate student. At the secondary school level, teacher aides might be apprentice teachers, lay men or women, or high school seniors who have studied bookkeeping successfully in the previous years. Why pay a high salary to a professional teacher and then consume his time and mental energy with tasks someone at a much lower salary can do as well or better, and probably more gladly?

The proper use of teacher aides saves from one-fifth to one-third of the time of the professional teacher. In the bookkeeping and accounting course where large amounts of student work must be evaluated and where laboratory sessions are a necessity, the saving could be even greater.

Using Videotapes, Kinescopes, Films, and Filmstrips

While feedback from members of the class is desirable, it is not essential that *all* teaching demonstration be live. In the future we will see more use of television in its various aspects and the use of films and filmstrips in bookkeeping and accounting classes. They will not be used alone but rather in conjunction with the "live" teacher. Courses such as bookkeeping and accounting, which make considerable use of visual materials, will be particularly adaptable to such techniques. Such devices permit the teacher to present close-up demonstrations with bookkeeping materials in a better way than could be done before.

The use of videotape provides a new dimension to the quality of television instruction for the future. Videotape recorders that reproduce TV demonstrations electronically permit immediate playback. With such innovations teachers can continue when ill or absent to meet classes with prerecorded lectures or demonstrations. Videotape instruction will relieve the teacher of much "parroting" from semester to semester and will enable him to criticize himself and "polish" the videotape or his "live" lecture presentations.

Kinescopes can be prepared as films from the videotape and shown as motion pictures. While the quality is not normally as good as the videotape, the fact that it can be played back on a motion picture projector permits wider use of the device. They may be used to present class lectures for the first time, or for review on an individual or small-group basis. In addition they may be viewed by students who miss the original class lecture or film showing. Why should not a presentation by motion picture be just as effective as teaching by television? The television series of lessons in economics taught by Coleman and others during the 1962-63 school year were used with teachers in the form of motion pictures in several teaching centers during the 1964-65 school year. Motion pictures should be equally effective in teaching bookkeeping and accounting.

Filmstrips may be used by individuals or small groups as orientation for class lectures, as supplemental instruction, or for review. We do not get through to all students at the same time, or in the same way. So the use of varied means to supplement and complement the "live" teacher is essential to fully effective teaching.

The Multiple-Purpose Room

All that has been proposed so far infers that students are mature enough to assume some responsibility for their own learning, seek out assistance, and utilize the various teaching media available to them.

Freeing the instructor of routine tasks as has been outlined makes him available for conferences on an individual and small-group basis. Teacher aides can explain many points that will enable the students to move ahead with understanding at times when the instructor is occupied with planning future teaching demonstrations or devising new teaching ideas and techniques.

Filmstrips are cataloged and stored in such a manner that the particular strip needed is available and easy to find. The projector and screen are always in the "visual corner." This requires a laboratory or practice room with tables and chairs suitable for either individual or small-group (four or five students) work.

In one corner of the room a small viewing screen may be painted right on the wall. This viewing area is equipped with a filmstrip projector and screened off from the rest of the room with a partial partition about eight feet high. The third side is entirely open. The filmstrips may be stored on shelves along the wall that constitutes the fourth side of this area.

At stated times the instructor would be in this room to help students. At the other times teacher aides would be present. When a formal class presentation of a traditional nature seems desirable, a class session for approximately 30 students could be held in this room by having all students face the front of the room.

Chalkboards would be installed across the entire wall at the front of the room, and a second wall could be used for both chalkboard and tackboard.

In one part of the room materials and equipment would be available for making posters and transparencies. At times when teacher aides are not needed to answer questions and assist students with their problems they might spend their time preparing teaching aids. A table should be available that would be large enough to hold the equipment needed as well as provide working space.

CONCLUSION

One can hardly say that an explosive revolution is going to take place in the teaching of bookkeeping and accounting; however, we can see that the rate of change is constantly increasing. The use of new media is not going to eliminate the good and the effective techniques of yesterday from the classroom. Instead, it is going to cause bookkeeping and accounting teachers to re-examine their old techniques and to discard the ineffective and the bad. From the older methods that are good and from the newer that are effective will evolve a new outlook, a new system of instruction. And because a given new media will work for one teacher, it is no indication that it will fit into the system or pattern of instruction adopted by another. While one discovers that the best technique available for introducing the worksheet is a polished videotape, another will conclude that nothing can beat the live teacher at the chalkboard. Each bookkeeping and accounting teacher will determine what is best for him and consequently best for his students, and through ingeniously hard work will provide them with the best total system of instruction possible.

CHAPTER 9

New Media for Teaching General Business

LOHNIE J. BOGGS, Arizona State University, Tempe

Belatedly, but at long last, local, state, and national authorities, both politicians and educators, have recognized the need for and necessity of focusing their attention upon the vital role that the general clerical occupations play in our economy. There are further indications that these leaders recognize that if "all the children of all the people" are to become employable and are to have a place in our economic hierarchy, then one of the most valuable avenues will be through the vehicle of an up-to-date general clerical program.

These are not idle statements—these are facts. The late President John F. Kennedy's insistence upon area redevelopment educational programs, President Lyndon B. Johnson's "War on Poverty," the Vocational Education Act of 1963, and increasing emphasis given by the several states to projected manpower needs, all put education for the clerical office occupations in a new and extremely important light.

Before there can be an intelligent discussion of new media in general clerical practices, it is wise to develop a profile or to determine who is a clerical office worker, what are his duties, what is his future, and then to define what a general clerical class is.

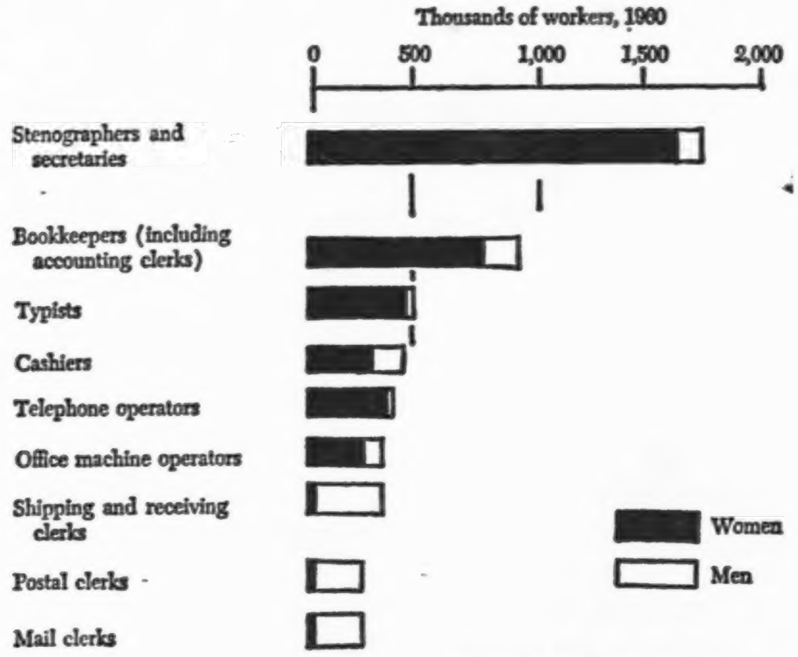
Who. Clerical workers total approximately ten million persons who concern themselves with the processing of the mountains of paperwork necessary for the daily operation of a modern business office. (Chart I.) Chances are that the clerical worker is a high school graduate, is female (two-thirds of all clerical workers are), and had some on-the-job training. There is a slight possibility that our clerical worker was a member of a cooperative office education program, and that a requisite for permanent employment was the successful completion of some employer's aptitude test.

Duties. According to Terry,[1] the modern office worker spends his working time performing these major activities.

---

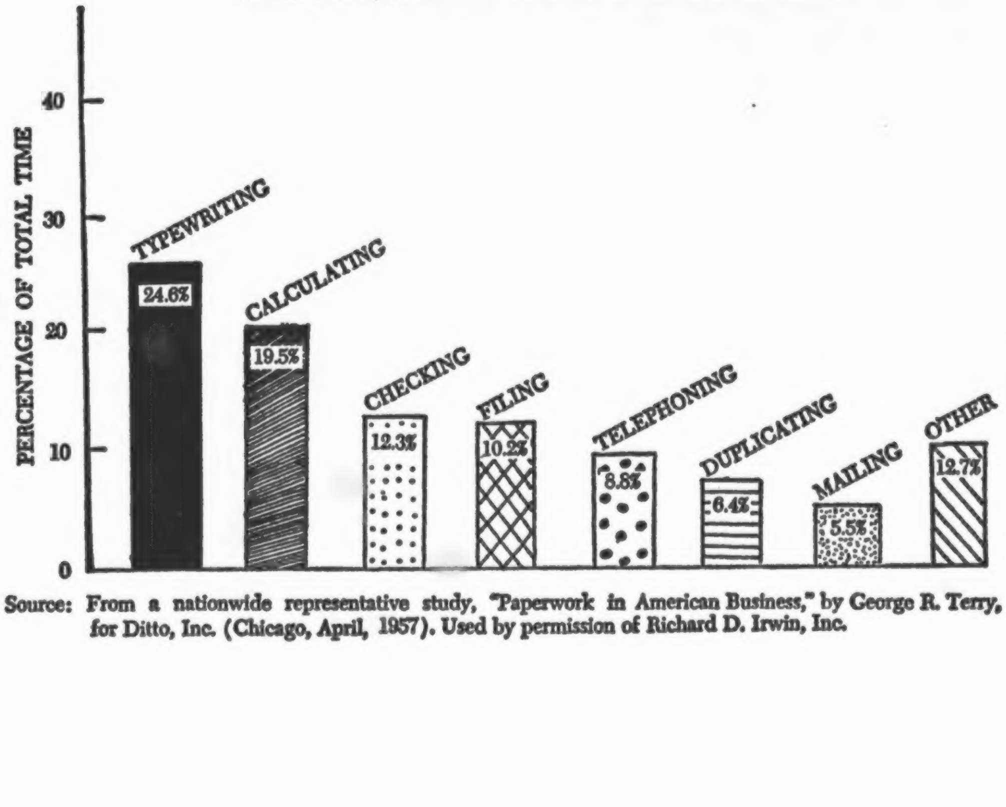
[1] Terry, George R. *Office Management and Control.* Homewood, Ill.: Richard D. Irwin, 1962. p. 28.

CHART I. MORE THAN ONE-HALF OF ALL CLERICAL WORKERS ARE EMPLOYED IN THESE OCCUPATIONS.



Source: U. S. Bureau of the Census.

CHART II. MAJOR ACTIVITIES MAKING UP OFFICE TIME.



Source: From a nationwide representative study, "Paperwork in American Business," by George R. Terry, for Ditto, Inc. (Chicago, April, 1957). Used by permission of Richard D. Irwin, Inc.

This chart indicates the major areas of instruction that should be covered in a general clerical class. To point up these instructional areas and perhaps what might be done with them, a study of some of the job titles and descriptions used by major employers who have workers performing these activities is in order.

JOB TITLES AND DESCRIPTIONS[2]

1 Typist-A

Types rapidly and accurately on different machines varied material of a nature requiring a general knowledge of the organization, terminology and procedures. Plans the setup and arrangement for typing complicated tables, reports and other material from rough drafts. Must use judgment and skill in carrying out assignments with a minimum of supervision. May cut stencils or hectograph originals, address envelopes and do clerical work as a minor portion of overall assignment.

2 Typist-B

Types material such as letters, reports and tabulations in which setups and terms are generally clear and follow a standard pattern. Should be accurate, have fair speed and the ability to carry out assignments under supervision. May cut stencils or hectograph originals, address envelopes and do clerical work as a minor portion of overall assignment.

3 Calculating Machine Operator-A (Senior)

Operates calculating machine (comptometer or other type) a major part of time to perform varied or complex computations and including the basic computations of adding, subtracting, multiplying and dividing. Frequently required to exercise judgment in selection and application of data; knowledge of background subject matter usually necessary. Generally checks and verifies computations.

(Exclude employees whose jobs require only incidental use of calculating machine or who use it only for adding and subtracting.)

4 Calculating Machine Operator-B (Junior)

Operates calculating machine (comptometer or other type) a major part of time to perform simple, standardized operation. Little judgment required and knowledge of background subject matter not necessary. May perform all basic computations. May check and verify.

(Exclude employees whose job requires only incidental use of the machine.)

5 Payroll Clerk

Maintains payroll records. Calculates earnings based on time cards or similar records. Posts calculated data to payroll sheets. May make out checks and assist paymaster or other officer in making up and distributing pay envelopes. May compile periodic payroll reports or earnings records.

---

[2] National Office Management Association. *Office Salaries.* Phoenix, Ariz.: The Chapter, 1964. p.3.

6 **Bookkeeping Machine Operator**
Operates bookkeeping machine, with or without typewriter keyboard, and performs related clerical duties.

7 **Clerk, General-A** (Senior Clerk)
Performs fairly complex and responsible clerical duties in accordance with standard practice. Work usually requires independent analysis, exercise of judgment, and a general knowledge of department or company policies or procedures related to work performed. Work not usually subject to detailed verification.
(Exclude supervisors and those assuming responsibility at policy making levels.)

8 **Clerk, General-B** (Junior Clerk)
Performs routine clerical duties under supervision such as posting data on records, checking, copying and addressing envelopes. Duties performed require little previous experience and only nominal judgment. May do some typing.

9 **File Clerk**
Arranges, sorts and files routine material (correspondence, cards, invoices or other records) that has already been classified or indexed. May classify and index simple material. Removes material from file on request and may keep record of disposition. No previous clerical or filing training

10 **Telephone Switchboard Operator**
Operates at a multi-position switchboard (usually full-time) handling all types of telephone calls with courtesy, tact and speed. May operate various types of in-plant communication systems; should have good knowledge of firm's personnel. May keep records on calls and do other minor clerical duties if clearly subordinate to operator assignment.

11 **Telephone Operator-Receptionist**
Operates on automatic, manual, or cordless switchboard (usually single position) at entrance to plant or office and acts as receptionist. Must use judgment, tact and courtesy in meeting public and directing them to proper people. Handles all calls and keeps records of the transactions when necessary. May handle in-plant communications, such as paging and public address systems. Familiarity with personnel and their location is essential. May do incidental typing or clerical work.

12 **Duplicating Machine Operator**
Operates stencil, fluid (spirit) or simple offset type office duplicator. Responsible for mechanical operation and makes necessary minor adjustments and repairs to produce good quality reproduction.

13 **Mail Clerk** and/or **Messenger**
Circulates interoffice mail, delivers messages and supplies within and/or outside the office. May process incoming and outgoing mail. May operate related machines, keep related records, and perform related or other minor office duties.

This examination of major activities performed with job titles and descriptions points out the duties of the clerical office employee and leads naturally into the question of what the future holds for this type of worker.

Future. Best estimates indicate that for the foreseeable future, employment opportunities for clerical office workers will be good. It has been reliably suggested that several hundred thousands of clerical and related jobs will be available each year throughout the remainder of the 1960's. According to the 1963-64 edition of the *Occupational Outlook Handbook*, "Over the long run, employment in clerical occupations is expected to increase rapidly. It is estimated that by 1975, close to four million more people may be doing work of this kind than in 1963."[3] Refining this statement somewhat, it can be said that the largest segment of white-collar workers is in the clerical group. Nationally, the clerical group now numbers ten million, by 1970 it will reach twelve and one-half million, and by 1975 there will probably be fourteen million people engaged in the clerical and related occupations.

General Clerical Office Practice Class Defined. In the national sense, or for the purpose of statistics, summaries, and the census, clerical and related duties have a much broader connotation than is generally ascribed by the business education departments of schools to this term. Historically, and perhaps by habit, "general clerical" has meant many things to many people and covered such a wide gamut that it has been difficult to discern just what it is.

As our business education programs in the secondary schools grow and become more refined, it becomes incumbent upon us all to be aware of and provide for that group of business students who are not "specialists," not "highly skilled," and in some instances not the "elite corps" of our departments. Thus the need for and development of the "general clerical" area. It appears then, that on the secondary school level, "general clerical" is the preparation of students for office activities not usually assigned to those (students) specializing in bookkeeping, stenography, sales, or management.

"General Clerical Office Practice" is usually a junior or senior level course (taking cognizance of the dropout problem, perhaps it should be placed earlier in the business program), frequently with but one prerequisite—that of beginning typewriting. It is generally conceded that some of the more desirable objectives for such a program are to:

---

[3] United States Department of Labor. *Occupational Outlook Handbook, 1963-64.* Bulletin No. 1375. Washington, D. C.: Government Printing Office, 1964. p. 267.

1. Provide a job entry level of training for the most common clerical occupations.
2. Further develop the skills of penmanship, arithmetic, and English.
3. Grow in skill development by applying basic skills to "realistic" clerical jobs.
4. Make the students aware of job opportunities available in the community and the qualifications for these jobs.
5. Develop personal characteristics, attitudes, ideals, and work habits considered essential in business.
6. Develop the ability to use the problem-solving approach.
7. Develop an understanding of the relationship of the office to business as a whole.

NEW MEDIA

Today, as perhaps in no other age, the public schools are being pressured to meet rapidly changing circumstances. These circumstances are brought about by the ever-increasing numbers coming to the schools, previously undreamed-of technological change, and the necessity of achieving "total performance" on a budget that is much too severe. If the schools are to meet these circumstances and are to fulfill these purposes, it becomes essential to consider new media, new techniques, and new ways to accomplish their goals. As a result, current instructional practices must be and are being questioned and re-evaluated.

the schools are to meet these circumstances and are to fulfill these pur-

This questioning and re-evaluation has brought to light the need for and importance of tools, media, and if you will, "glamour hardware." These new media might be best classified into four groups: (1) audiovisual, (2) team teaching, (3) self-instructional, and (4) automation. Critics might say nothing new here, audiovisual is as old as the spoken word and papyrus; team teaching, really nothing more than sophisticated departmentalization; self-instructional, a good homework assignment; and automation is as old as ancient China and the abacus. Here, however, the analogy ends. It ends with the one all-important act of communicating. Nothing is of value until it is communicated, and in today's period of technological advances, the schools are communicating and reaching out to accept the challenges and the rewards that are the fruits of innovation.

Ways. As review, Chart II shows that clerical workers spend the bulk of their time performing such activities as typewriting, calculating, checking, filing, telephoning, duplicating, and mailing. For the purposes of this discussion, the new media have been grouped in audiovisual, team-teaching, self-instructional, and automation. Great numbers of clerical activities could be related to the "new media," but it is sufficient for illustrative purposes to show how certain instruments or techniques included under this generic heading or that of "glamour hardware" do relate to several selected clerical activities.

AUDIOVISUAL

Television. Teaching by television is certainly not new, but the use of television as directly related to general clerical needs much development. Allied to general clerical and a possible point of departure for new efforts in this direction, the new user would want to consider the works of T. James Crawford,[4] William Pasewark,[5] Harriet Withers,[6] and Chester Johnson.[7] These are but several of those in business education who have pioneered teaching by television. However, before going full speed into teaching general clerical by television, a study of the works of Costello and Gordon[8] and Kumata[9] seem absolutely essential.

Hazarding an opinion—one not based on research—it appears that the most valuable place for television in general clerical would be in the area of supplementary materials or in a program of enriching or reinforcing what has already been learned. This is not to decry the potential benefit and value of television in general clerical. But as currently conceived, this class has too many persons doing too many things at too many different times to use this medium in any other way but for reinforcement until much planning and practical work has been done in the clerical area.

Controlled Reader. The "Skill-Builder Controlled Reader" has limitless possibilities for general clerical classes. Not only does it enhance reading skill, the purpose for its original design—its usefulness in improving skill in typewriting is well known. Research by Randall M. Kline[10] particularly points out its value in this area.

---

[4] Crawford, T. James. "Television Typing Research." *The Balance Sheet* 39:148-149, 184; December 1957.

[5] Pasewark, William R. "Teaching Typewriting Through Television." *The Balance Sheet* 40:388-392; May 1959.

[6] Withers, Harriet E. "Teaching the Skill Subjects by Television." *American Business Education* 18:227-234; May 1962.

[7] Johnson, Chester. "Teaching Typewriting Via Television." *Business Education Forum* 17:32-33; November 1962.

[8] Costello, Lawrence F., and Gordon, George N. *Teach with Television.* New York: Hastings House, 1961, pp. 13-14.

[9] Kumata, Hideya. "A Decade of Teaching by Television." *The Impact of Educational Television.* (Edited by Wilbur Schramm.) Urbana: University of Illinois, 1960, pp. 176-185.

[10] Kline, Randall M. "Using the Controlled Reader in Teaching Business Subjects." *American Business Education* 18:207-211, 234; May 1962.

The controlled reader is ideally suited for forcing fingering and technique on adding and calculating machines. Transcription techniques such as spelling, punctuation, proofreading, placement and visual checking are all well abetted by this visual device.

Loop Films. The loop films are allied to the controlled reader, but offer new and distinct general clerical possibilities. Normally, rotation plans are used in this class. In this case, loop films would be an ideal device to assist the teacher. Each "rotation bank" could preview or study its assignment, and have the advantage of as many replays as necessary until each member of the group understands his particular assignment. Loop films could be adapted to any phase of the course, and each student would be able to understand each procedure before application. The uneconomic waste of time, effort, and materials is thereby reduced.

Audio-Programed Instruction. The use of tapes in business education is well known, but have you considered their many uses in general clerical? Our publishers have a variety of aids available, some teachers have prepared their own, but have we given serious thought to using our own school's language laboratory for this purpose? Great opportunities for cooperative efforts and utilization of facilities are offered here.

Fred S. Cook[11] gives a comprehensive picture of practical applications in a "typing lab" and the February 1964 edition of *Education Screen and Audio-Visual Guide* points out some of the techniques and advantages of audio-programed instruction.

Eduphone. One last audio aid with considerable potential in the general clerical area is the "Eduphone." This is an amplification of the telephone equipment used for teaching shut-ins and the conference phone of industry. Its main possibilities would be in the realm of enrichment. In this instance, time and distance are not bars; outside consultants and resource people can visit the class via closed-circuit telephone.

"Eduphone" should make it possible to have experts speak with students about the training needed to qualify for initial jobs and the opportunities in any particular firm or endeavor. Teachers could hold conferences and exchange ideas, and particularly skilled teachers in certain areas could be "piped in" to make presentations to a general clerical class.

TEAM TEACHING

Team teaching, as with audiovisual, is not new to business education. Much of the literature in this area concerns itself with team teaching in typewriting. However, even before it had this sophisticated name, practically all business classes utilized some of the techniques commonly associated with team teaching. Student assistants, helpers, better students, and monitors were on hand to assist the teacher. Unfortunately, this concept still pervades much of the thinking concerning this technique. The monitor system aided by a master teacher was used many years ago and failed because it did not get the job done.

---

[11] Cook, Fred S. "Tomorrow's Typewriting Laboratory Today." *American Business Education* 18:202-206, 226; May 1962.

Today, in business education, we must be aware of the past and make sure that our concept is modern. This technique may be practical for a general clerical course. However, let us make sure we find a correct approach to this medium, and with genuine experimentation, proceed to attain this goal.

Here are some guides to follow: Are there sufficient students taking the course to make it practicable; sufficient teachers; equipment; time; and space available to complete the job? Staff utilization studies frequently point out that the usual team is composed of four members; however, smaller teams are quite frequent.

Trump and Baynham in their *Guide to Better Schools*[12] deal with flexible curriculums and teaching media. They see the program broken down into large groups, small groups, and independent study. The program is characterized by flexibility and staff utilization. Results of this work appear good, but is general clerical ready for this?

Business education can and must answer this question. We have started in typewriting, but we must read, plan, and experiment if team teaching in our area is to reap the benefits that are inherent in this plan. Team teaching must be more than two teachers handling twice as many students! For a good start, read Iannizzi and Robinson's "Team Teaching Worked for Us in Office Practice."[13]

SELF-INSTRUCTIONAL TECHNIQUES

Self-instructional techniques may be broken down into many groupings, but the four most commonly used are: audio, visual, programed instruction, and the teaching machine. Audio and visual have been mentioned earlier, but still remaining in the realm of "glamour hardware" are programed instruction and the teaching machine. It would appear that by the "nature of the brute" or the necessary "three-ring circus" involved in the teaching of general clerical courses, that programed instruction and teaching machines would be of the greatest value and present unlimited possibilities for the improvement of instruction in general clerical.

---

[12] Trump, Lloyd, and Baynham, Dorsey. *Guide to Better Schools.* Chicago: Rand McNally & Company, 1961. p. 23.

[13] Iannizzi, Elizabeth, and Robinson, Charles. "Team Teaching Worked for Us in Office Practice." *Business Education World* 43:19-20; January 1963.

A first step before exploring uses would be the determination of what these devices are. Programed instruction also is not new; S. L. Pressey of The Ohio State University was working with programs as early as the mid twenties. However, it is her and now that we are most concerned with uses and application.

Programed Instruction. Basically in programed instruction, the student works alone and at his own rate. He is given small bits of information and is expected to react or respond to it. He is then immediately told of the accuracy of his response. The cycle is repeated step by step and over and over until the program has been completed.

In constructing programs for general clerical courses, the teacher has several channels of response open. Programs today are of four types: write-in or completion, multiple choice, straight-line, and branching. The latter two types deal with the sequence with which the student proceeds through the frames.

The Teaching Machine. The teaching machine is an instrument or piece of "glamour hardware" that has been receiving much attention. However, the teaching machine is only a device, mechanical or electronic, that regulates the frames in a program and provides the student with the accuracy of his response. Even though some machines are quite sophisticated and do a variety of things, essentially they are no better than the program they present. This, then, is the charge to the general clerical teacher—the development of "good" programs for his students.

In addition to the teaching machine, the next step is the use of programed texts. Although much needs to be done in this area, in effect, the programed text is not new because leading publishers in and out of business education have offered them for several years.

The development of programs and the adaptation of existing materials to such areas as spelling, grammar and punctuation, arithmetic, letter writing, and filing is of particular interest to the general clerical teacher. But of more importance, complete and unmistakable instructions for each rotation or topic covered could be programed. These instructions could range from the principles of a new subject to what materials and supplies are needed or, to the most time-consuming task of all, a thorough step-by-step orientation to the operation of any piece of equipment necessary for the course.

AUTOMATION

Of all the new media available to education in general, and to general clerical specifically, the realm of "automation" presents the greatest challenge. Automation is an all-encompassing term. It is not new; however, the horizons or vistas that it opens for business education are new. This is why it is so perplexing. We do not know how to cope with the multitude of avenues that are now opening for us. We fear what we do not know.

Dr. Keith Davis, one of management's outstanding authorities, recently stated that Americans need not fear general unemployment from the advance of automation.

> There is no evidence that automation will cause general unemployment. . . . Rather than decreasing available work, automation releases man to perform work of a higher order—more intellectual, creative, and idealistic. . . . However, automation does displace individual persons when their existing skills become surplus or unsalable.[14]

The nature of clerical work is and will continue to change in drastic proportions. Unless new concepts are introduced into clerical classes, automation may well be the "Clerical Practice Killer" that E. Dana Gibson[15] says it could become. If we remain docile and keep our definition of business education narrow—perhaps it deserves to be "killed."

Automation offers the possibility of training the new, retraining the old, and has yet undreamed of areas for development. Earlier in this section, it was said that automation was a challenge—this is not true! Automation offers business education the greatest opportunity it has ever had. New concepts, new ideas, and bold leadership are needed to take advantage of our opportunity. Has it ever occurred to us that perhaps the "big three" should not be *the* "big three"? When the Latin Grammar School could not get the job done, we developed the Academy. When the Academy failed, another institution took its place, and so on through history. This *could* happen to us. Is business education, as currently conceived, getting the job done? The opportunity is ours!

The high school clerical practice class is the ideal place for much of the training that is needed for the processing of data or the mountains of paper required for the operation of modern business. Remember the wag who said that if all of the paper that is used in preparation for the "moon shot" was placed in one neat stack, the paper would reach the moon before the rocket? This, of course, was in jest; but it attests to the myriads of clerical and paper detail that must be performed if business is to function properly.

---

[14] *Phoenix Gazette*, July 8, 1964. p. 2.

[15] Gibson, E. Dana. "Automation—The Clerical Practice Killer." *Business Education Forum* 17:11-12; February 1963.

Let us not be misled into believing that all automation involves computers. It does not; however, even in many highly automated or computerized organizations, a great variety of these operations can be handled by high school graduates with some preparation for these jobs. Paper work and information handling is the job of the office—this is clerical work and the high school student and graduate can do clerical work. So, let us teach modern clerical work in general clerical.

There are several ideas that might help improve and bring up to date the general clerical classes. An increased emphasis upon typewriting, particularly with electric machines, is paramount. A unit on "computer language," if for nothing more than new terminology, has value. "Who was Hollerith, who was Powers, what does binary mean—how does it work?" "I know all about a Flexowriter, but I never heard of an automatic typewriter!"

Work-flow diagrams could be presented and developed. Many types of charting could be done. It might make the operation of the class and classroom facilities more efficient—not to mention the reduction of strain and fatigue that would accrue to the teacher. Think "office," not traditional pedantry.

Another idea and desirable activity for general clerical would be training in card-punch stroking. IBM has developed an alphabetic key-punch simulator element for its Selectric typewriters. You may use the same typewriter that you use to teach typewriting. Keyboards can be modified to show both arrangements when typewriters are used for this dual purpose. In addition, Clayton E. Leach[16] has successfully modified other electric typewriters for key-punch training. This type of training would fit the new concept of general clerical and at a price that is still within reach.

Even a slight degree of training on computer orientation and problems might be included. A desk-sized, miniature computer is now available. It is a small-scale computer simulator and has a nominal cost. No attempt is made here to develop "computer people" or programers, but it would be an excellent opportunity to learn the "language" and to become more familiar with the environment.

---

[16] Leach, Clayton E. "Card Punch Training: Another Marketable Skill for Our Graduates." *Business Education World* 44:26-27; May 1964.

Our traditional concepts for the receiving, handling, processing, filing, and storing of data are changing. With increasing impetus, these procedures will continue to make today's concepts obsolete. We must keep pace.

ONE LAST THOUGHT

We have always thought of general clerical as being all things to all people—but has it really been? Why should we not borrow a page from the physical education people and work out an adapted program? This adapted program refers to that phase of physical education which meets the needs of the individual who, because of some physical inadequacy or other deficiency, is temporarily or permanently unable to take part in the regular physical education program.[17]

Applying this program to general clerical, the teacher has available a wide range of activities, but not all activities are engaged in by all students. Only those things which are best suited to a particular student's abilities and needs are utilized. Thus, we are starting to provide for individual differences. Through the development of your own materials transmitted via the new media presented in this chapter, general clerical can become the course we have always wanted it to be.

SUMMARY

Ten million people are currently employed in clerical work. Every year for the next decade several hundreds of thousands of jobs will probably become available to people who desire employment in this area. The future for clerical workers and employment in clerical and related fields does indeed look bright.

The general clerical course conducted at the high school level can do much to help prepare and supply applicants for these jobs. However, to do the job adequately and to be of the utmost benefit to students who need this type of preparation, the current concept of general clerical needs to be brought up to date. This new concept needs to be planned and constructed around what this chapter has termed "new media."

The "new" general clerical teacher will build his course around people; but in order to do the most for people, he will accomplish his goals via the increased usage of audiovisual, team teaching, self-instructional, and automation vehicles.

---

[17] Bucher, Charles A. *Administration of School Health and Physical Education Programs.* St. Louis: The C. V. Mosby Co., 1963. pp. 397-410.

CHAPTER 10

New Instructional Media in Business-Economic Education

RUTH B. WOOLSCHLAGER, Northern Illinois University, DeKalb

Teachers in the whole area of business are facing the "finest hour" in educational technology. Never since the process of formal teaching began have so many resources and devices been available to make teaching and learning exciting and lasting. The technological revolution which has wrought such great changes in the world of commerce, transportation, and communication is at the door of the classroom, if not already inside—and perhaps not a semester too soon. Especially in the field of business, education for an age of automation presents a signal challenge. There are more people to be taught as a result of the population explosion. There is more to be learned because of the knowledge explosion. And the future in a highly industrialized society requires a more highly trained and educated citizenry than ever before, if the challenge is to be met.

Education must prepare young people to *do* and to *know about.* Business education must continue to turn out products who have the skills and abilities to perform a useful service and to earn a living. Perhaps even more important, all citizens must be equipped to lead individually satisfying and socially useful lives in a world which will become more complex and impersonal. People will be needed who can help to create some new values and systems to accommodate the economic and political changes brought about by new technology. As technological know-how advances, each individual in a job or profession will become more and more a small part of a gigantic enterprise; the totality of our economic machine will be increasingly difficult to comprehend, especially for young people whose strongest motivations are toward their own immediate needs and wants. Yet the preservation of the integrity of our

---

NOTE: Advice concerning technical information in this chapter was supplied by Dr. Robert Hunyard, Director, Instructional Materials, Northern Illinois University, DeKalb, and Dr. Irving Spigle, Director of Curriculum Development and Research, Park Forest School District 163, Park Forest, Illinois.

society and the individuals within it depends on the continued ability of laymen to comprehend the economic system and participate effectively and fully. Students must see clearly the role of inflation controls, the uses and sources of tax monies, the relationship of labor to management, the investment opportunities in the many facets of a growing economy, the problems of world trade, and the intricacies of a common market to mention just a few critical areas. The time of teaching students only how to write a check or fill out an income tax form has passed. Full development of each person prohibits excessive reliance on a technocracy or an economic elite for decision making. Herein lies the importance of *knowing about.*

Lest the theory involved in *learning about* remain dead and static, teachers of economic concepts must make use of every conceivable device to communicate the excitement of a great and growing economy, to explain its workings, to enable participation in the creation of humane social controls over economic operations. Daily, timely illustrations must be used. Questions must be raised and the power of the individual student to answer his own questions must be demonstrated. It is in this process of teaching youth to know about that the new media will perform their greatest service to the individual and thereby to society. It is in using every possible device to achieve his goal that the teacher will continue to perform the dual function of a perpetuator of the culture and a stimulus for the creation of new solutions.

NEWER MEDIA

The Eight Millimeter Single-Concept Film

This device promises to be a major advance in speeding up learning for the individual or small group. Designed to present a single idea in about four minutes running time, such films can be a boon to students. Viewing by small groups doing outside or in-class work can be easily arranged in a room designed with small booths or carrels or even in a classroom corner. Materials of this nature are intended to individualize both initial and remedial instruction. For a nominal cost (about one-fifth that of 16 mm. projector), such equipment can be installed in every classroom. Although at the present time no such films have been produced for economic education, in all probability the future will bring a series dealing with major business-economic concepts. Single-concept films now available are without sound; however, it is possible that very soon an automatic channel-feed device which takes both magnetic and optical sound for an 8 mm. sound projector will be on the market.

Programed Learning

According to a recent article in *Dun's Review* the teaching machine industry has been forced to make an agonizing reappraisal of its own purpose and function. From 1960 on, over 100 companies produced teaching machines ranging in price from $12.50 to $2500. Much of the optimism concerning teaching machines taking over the major part of instruction was caused by newspaper publicity making overrated claims for teaching machines as a panacea for instructional problems at all levels. One professor thought it would be possible to eliminate not only the teachers but the school systems.[1] Further research proved, however, that the program to be used with the machine was the important factor. Because of the lack of depth in some educational programs, meager sales have forced industries to cease manufacturing teaching machines, especially for school use—industry proves to be a far better market for a $30,000 program than does a school system.

A program consists of carefully organized sequences of questions and answers usually called "frames." The materials are designed to require the student to respond actively to each frame either by verification or correction of the material presented. The student proceeds through the subject matter in small steps. The materials are designed to ensure a high level of correct responding at all times. As the student progresses through the materials, he continues to subtly expand his knowledge to the point where he is making complex responses accurately and easily. A high level of success, coupled with an immediate evaluation of his response, is supposed to keep the student motivated so that he can learn difficult material easily and rapidly.

Learning programs of the printed-text variety have continued to increase in number. In *Programs, '63* there are 352 programs outlined, with "large, absolute gains (in numbers) of programs in business education. . . ."[2]

Under the heading "Business Education and Economics" the following programs appear suitable for the economic areas of instruction, omitting shorthand, accounting, and management:[3]

---

[1] Buckley, Noel. "Programmed Learning: Return to Reality." *Dun's Review*, May 1964. pp. 46, 123-129.

[2] *Programs, '63, A Guide to Programmed Instructional Materials.* The Center for Programmed Instruction, Inc., U.S. Department of Health, Education and Welfare, Office of Education, 1963. vii.

[3] *Ibid.* pp. 83-131.

Business Law—John Fonseca, Hamilton Research Associates, Seneca Turnpike, New Hartford, New York. Programed Text, 6500 frames, paperback, 800 pages.

Challenge to the American Economy—Rendigs Fells, and others, Allyn and Bacon, Inc., 150 Tremont Street, Boston 11, Mass. Programed workbook, 299 frames, paperback, 116 programed pages, $3.95.

Consumer Finance—Credit Judgment—Marshall Arky, and others, Roto Vue; Model Publishing Company, 1602-08 Hodiamont Street, St. Louis, Missouri. Programed text, 800 frames paperback, 150 pages, available in 3 separate units at $5.00 each.

Fundamentals of Finance and Investment—Technical Staff, General Education, Inc., 96 Mount Auburn Street, Cambridge 38, Mass., for use in Self-Tutor machine, program reusable, 3000 frames, $30.00 (machine and program).

Insurance Premium Financing—Education Engineering, Inc., 381 West 7th Street, San Pedro, California. Programed text, 3240 frames, paperback, 108 pages,, available in 3 separate units at $3.75 each. For use in Speed machine, program reusable, $30.00. Machine cost $700 and $850.

Bank Teller Training Course—Richard Morris, Educational Methods, Inc., 612 North Michigan Avenue, Chicago, Illinois. Programed text, 750 frames, binder, 300 pages. Available in 5 separate units.

It can easily be seen that there is a large area in the business-economic field still untouched by program systems. One Illinois teacher has been experimenting with a program in stocks and bonds which shows promise for use in general business and consumer economics. The future should surely bring more sophisticated and varied programs which will, with or without machines, cause learning to be easier. It should also bring projectors with motion pictures in stopping sequence to accompany programed instruction.

Paperbacks and Pamphlet Material

There is no longer any justification for a one-textbook course in any economic education subject. Hundreds of paperbacks dealing with economic concepts appropriate for use at different age and ability levels are available. It is possible to build up sets of many different reference books for use by a whole class, small groups or individuals. Examples of worthy inexpensive publications are:

Buckingham, Walter. *Automation—Its Impact on Business and People,* Mentor, The New American Library, 1963.

Cochran, Thomas. *The American Business System, A Historical Perspective, 1900-1955,* Harper & Row Publishers, Inc., 1962.

Friedman, Milton. *Capitalism & Freedom,* Phoenix Books, University of Chicago Press, 1963.

Margolius, Sidney. *The Consumer's Guide to Better Buying,* Pocket Books, Inc., 1963.

Packard, Vance. *The Hidden Persuaders*, Pocket Books, Inc., 1957.
Porter, Sylvia. *How To Get More for Your Money*, Macfadden, 1962.
Rostow, W. W. *The Stages of Economic Growth*, Cambridge University Press, 1963.

Not to be overlooked is a myriad of well-prepared booklet and pamphlet materials. A reference for high-quality materials of this nature is *Study Materials for Economic Education in the Schools*, a report of the Materials Evaluation Committee to the Joint Council on Economic Education, October 1963, published by the Committee for Economic Development, 711 Fifth Avenue, New York 22, New York, priced at 50 cents. This publication adds 65 titles to the 96 in the original report published in 1961. Gladys Bahr, in a bibliographic chapter of *A Teachers Guide to Economics in the Business Education Curriculum*, indexes and classifies each of the original 96 titles in terms of suggested use. This source also contains additional paperback suggestions.[4]

Copying Machines

One of the most valuable of the new media is the modern version of the copying device. Verifax, Thermofax, Xerox, A. B. Dick, and Bruning are but a few of the machines available which, in varying degrees, make satisfactory copies of material through a photo process. Valuable articles and excerpts from books can thus be preserved and filed conveniently for teacher use at a later date. Care must be exercised, however, so as not to violate copyright regulations.

It is now possible to purchase machines which prepare duplicator masters directly from printed copy. This time-saving feature can be utilized to benefit each individual student in a basic business class. Machines which prepare transparencies vary in price from $150 to $1200, with the cost at approximately 25 cents a copy. The Viewlex, Copyeze, Thermofax Model 90 Transparency Maker, and the Xerox 914 are examples of such machines now used in schools.

The significance of copying machines to the basic business teacher is immeasurable. Teachers are finding it possible to present new types of material to students from a variety of sources on a daily basis. A section of the stock market page from the *Wall Street Journal*, a review of a business survey from the local newspaper, a graph or chart showing the tax revision schedule from *Changing Times*, an analysis report of business conditions from *Fortune,* or an especially pertinent quotation from a best seller can now be supplied to each student for all to read at once or made into a transparency for use on the overhead projector. Another added convenience is the transparency masters which are in the teacher's manual or workbook. Intricate art work required in illustrations, cartoons, or graphs can be used to benefit many viewers.

---

[4] Bahr, Gladys. "Materials in Economics for the Business Education Teacher and Student," *A Teachers Guide to Economics in the Business Education Curriculum*, Joint Council on Economic Education and National Business Education Association, 1963. pp. 94-104.

Copy machine materials can result in greater student interest in the subject studied and also serve to update whatever textbook is in use. The power of the visual image is indeed a great force in promoting learning.

ADAPTATIONS TO "OLD" MEDIA

The flannel board is one of the most useful devices in the teaching of "flow" ideas, such as the route of a check through the clearinghouse. Most teachers back the materials with either felt or sandpaper. Now a looped nylon fabric is available with hooks resembling fish hooks; heavy weights provide stronger adherence.

Animation of the overhead projector image whereby movement or flow—for example, a moving line showing the increase in GNP during the past ten years—is costly but possible. This is accomplished by adding a wheel to the machine and using two polarizing sheets of laminated cellophane. In general the cost of overhead projectors has been downward as the refinement of such equipment has taken place. A small compact model now available weighs only 14 pounds. In addition, these machines are now built with small tubes and fans which permit a higher light output for wattage consumed. The room need not be darkened as much as before, and the machine will operate more quietly and without the excessive heat of the older models.

Another advancement which means more effective use of the overhead projector is the variety of supplies which are available to the teacher. Colored acetates used as overlays either for shading or directing attention to certain portions of the material, washable and permanent colored inks, crayons, colored pencils, and special lettering guides help the teacher to use the machine more effectively. These are only a few of the multitude of teaching aids available for use with the overhead projector. The future appears bright, especially for teacher-prepared transparencies, either of the preplanned variety or the type spontaneously prepared during a class session.

There is definitely a trend toward the development of a series of films on a given subject, each unit designed to be used alone or with the series. Such groups of films exist in many subject fields including psychology, biology, humanities, and chemistry. The American Economy Series, presented over the CBS television network in 1962-63, is a good example of this trend in business-economics. These 30-minute filmed television programs can be purchased individually for $125; the complete set of 160 titles costs $9600. The only way that many schools could afford such films would be through a shared-cost plan; perhaps one university film library in each state could provide them on a rental basis.

The following American Economy films have proved to be unusually helpful in business subjects. Most of these can be used successfully at either the high school, junior college, or university level:

The World of Economics
A Look at the American Record
The Questions Economists Ask
The Worlds of "What Is" and "What Ought To Be"
Of Facts, Fictions and Fallacies
Introducing the Price System
Gross National Product and Its Cousins (2 parts)
What Money Is and Is Not
The Business of Banks
How Money Expands and Contracts
Banks for Bankers: The Federal Reserve System
Keeping Account of Businesses (3 parts)
An Overview of the American Economy
The Consumers' Side: Demand (2 parts)
The Producers' Side: Supply (2 parts)
The Labor Force in Flux
The Roots of Labor Unions
Union or Nonunion?
The Federal Budget: The Outflow
The Federal Budget: The Inflow
The Impact of Taxation
Promise and Puzzle in Automation (2 parts)
The Economics of Trading Among Nations
How the Soviet Economy Works
The End Is Just the Beginning

The majority of these lessons are taught by Dr. John R. Coleman, head, Department of Economics, Graduate School of Industrial Administration, Carnegie Institute of Technology. Dr. Coleman, an excellent teacher, used instructional media to the fullest.

Another series of television kinescopes, "Money Talks," was produced by CBS in the summer of 1962. Like the American Economy series, this set consists of a correlated 30-minute series titled: "Exports, Imports, Dollars and Gold," "Allocating Our Resources," and "The Case for Competition.' They are available for $135 each from Carousel Films, Inc., 1501 Broadway, New York, New York, 10036. In a sense, these longer films in series represent the exact opposite of the short, single-concept film idea described earlier. At any level, but particularly for the ninth and tenth grades it is important that a study guide be given to the students to aid them in understanding the material in the film.

The preview guide (opposite page), designed for "The Case for Competition," was developed by Ted Boduch for ninth grade business-economics classes in the laboratory school at Northern Illinois University, and for high school classes at Morton West High School, Berwyn.

Live and recorded television and radio programs continue to be useful in business classrooms. Many teachers and students get advance listings of appropriate programs and tape record or video-tape record them at home for later use. Wider use of the new video-tape recorder is now possible because of the reduced cost of the machine (now under $250) and the availability of the less expensive quarter-inch tape.

Photography receives new emphasis in the rejuvenation process of old media. Cameras purchased by the school for use of teachers and students vitalize basic business classes. At a school cost of approximately $150, a camera which adjusts automatically to light and distance conditions will permit the most detailed business activity to be brought into the classroom. A related medium which requires less work and skill than before is the print development process which takes only a few seconds and does not require the use of a dark room.

An interesting development in filmstrips makes this familiar tool more useful. Now it is possible to have filmstrips threaded with sound so that no companion device is necessary. To achieve accompanying narration in the past a teacher was required to use records or tapes. Slides can be shown and used more effectively than ever before. Equipment is available for $100 which uses 2 x 2 inch slides with a remotely controlled projector.

Adaptations may be made of the learning-laboratory technique for use in the business-economics area. This might be especially helpful for educable, mentally handicapped children. Only through the concerted use of many teaching aids can these children be given an appreciation of certain business processes common to all in everyday life. Perhaps in this kind of climate a *system* of instructional media can be used with advantage by great numbers of high school children who need to learn on an individual basis.

CONCLUSION

These new media bring the whole world into the classroom. Obviously, much will depend on the creativity and ambition of the teacher. With instructional technology rising to a new maturity and sophistication, the teacher will have more aids to use than ever before. By the same token,

FILM PREVIEW SHEET

"The Case for Competition"

Definition of Terms

Collusion—A secret agreement and cooperation between two or more persons for a fraudulent or deceitful purpose.

Subsidy—A grant of funds or property from a government to a private person or company in support of an enterprise which is advantageous to the public.

What are the four advantages of competition?

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

Listed below are businessmen's doubts about government's understanding of what competition is. What examples are cited to illustrate these doubts?

1. Monopoly ______________________________
____
2. Labor ______________________________
____
3. Profits ______________________________
____
4. Subsidies ______________________________
____

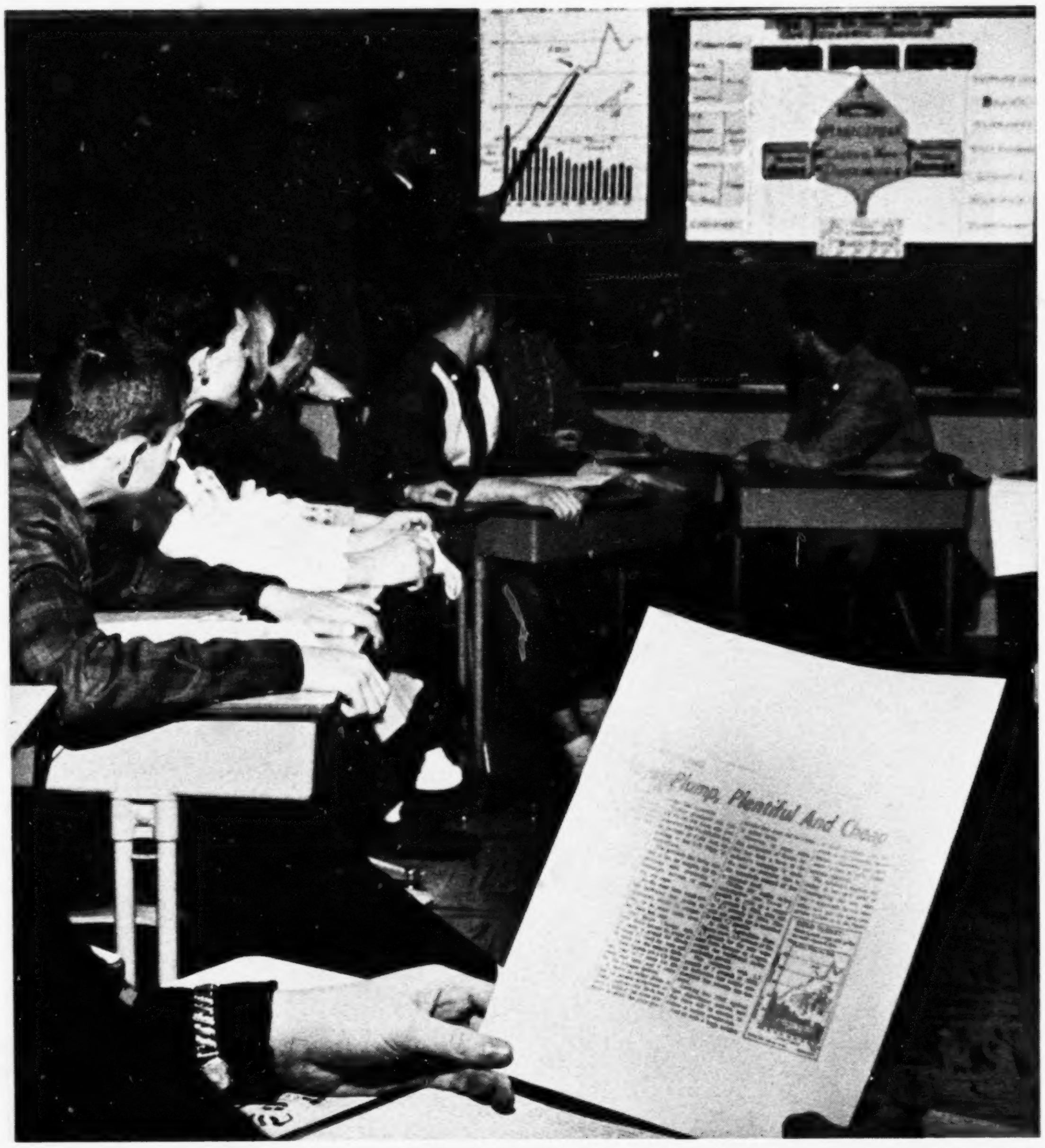
Listed below are government's doubts about businessmen's understanding of what competition is. What examples are cited to illustrate these doubts?

1. Monopoly ______________________________
____
2. Labor ______________________________
____
3. Profits ______________________________
____
4. Subsidies ______________________________
____

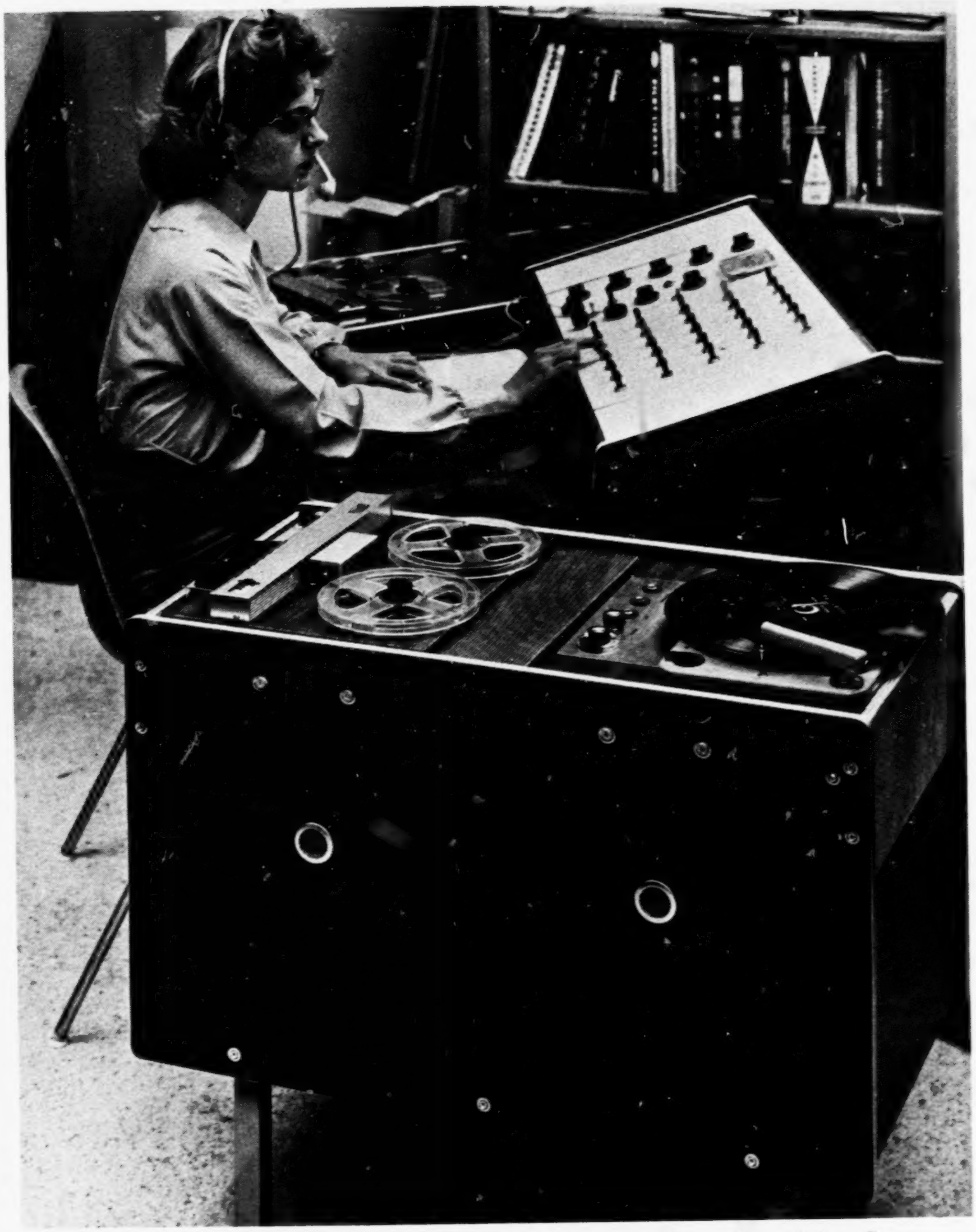
the ingenuity required of the teacher to gain maximum benefits will be greater than ever. The implications of many of these new devices for teaching cannot be determined, but it is certain that their use will become more central to the teaching process and that such use must be initiated by the teacher. The trend is definitely toward the refinement of technological tools of the type which will enable the individual teacher to prepare a variety of materials for each specific class and with less work involved. On the other hand, some films like Encyclopaedia Brittanica Films are pioneering in the development of a "package" of correlated materials for a given course, ranging from textbooks to charts, maps, films, transparencies, programs, slides, strips, tapes, *ad infinitum*. A series of source books entitled the *Educational Media Index* (McGraw-Hill Book Co.) was released in September, 1964. Number 4 ($5.55) in the series includes a list of materials for accounting, advertising, automation, banking and finance, management, marketing, and secretarial training. Number 13 ($7.45) covers economics, political science, education, government, law, and sociology. A revised edition of each volume is scheduled for release in 1966. These publications are extremely valuable to the business-economics teacher in that they furnish a comprehensive coverage of films, filmstrips, phonotapes, flat pictures, slides, transparencies, phonodiscs, videotapes, charts, maps, programed instruction material, and cross media kits.

New educational media must be utilized in the business-economics courses to challenge the gifted, to interest the average student, and to save disadvantaged youth from eventual school dropout. The maximum development of human talent rests heavily on the degree to which the teacher understands the impact of instructional technology and possesses the skill to use it.

(Opposite Page) The business-economics class is engaged in the study of factors which determine supply and demand. In this particular lesson, factors affecting the price of turkeys are being discussed in view of the forthcoming holiday. A newspaper article and graph dealing with demand, supply, and prices of turkeys (reproduced in multiple copies through one of the new photo processes) was distributed to each of the class members to add interest and facilitate understanding and discussion of the topic.



The reproduction of an item from today's newspaper is used as an instructional medium in this ninth-grade class at the Northern Illinois University Laboratory School.



Typical of learning center equipment is this console and modules displayed at the 1965 convention of the American Association of School Administrators.

CHAPTER 11

Dynamic Techniques for the Instruction of Business Law

ALVIN C. BECKETT, San Jose State College, San Jose, California

The importance of good teaching methods lies in the fact that these exemplary procedures create significant educational experiences for students. The teacher of business law who repeats business law textbook descriptions of law practices or decisions that courts have added to the innumerable volumes of record could very well be mated to a parrot. Students who come under the influence of business law teachers have every right to expect their mentors to be dynamic representatives of the business law areas surveyed in the classroom. Furthermore, teachers of business law should be able to recreate the world of business right in the classroom if lessons are to become part of a permanent mental acquisition. Classes in business law, of all the courses taught in the business program, should provide current examples of the best possible teaching techniques. The teacher of business law should be able to recapture the spellbinding manner of famous lawyers such as Henry Clay, Clarence Darrow, and Abraham Lincoln. All of this is possible with television in the classroom.

TELEVISION

Each reader of this chapter has watched a television program at one time or another. The chances are that such programs as *Perry Mason, The Defenders,* or *Divorce Court* have been seen by most. Television program producers, script writers, research authorities, and consultants are responsible for the perfection that must accompany every detail of the program. Team teaching with a group such as this to direct "Business Law in Room #39" certainly should capture the attention of all students enrolled in business law. Elimination of the commercials ordinarily shown in the televised program and the station breaks would tailor the 60 minutes (and maybe 90 minutes in some instances) to the limits of the ordinary business law class period. Reruns would really test the powers of observation for those who sat through the program prior to this showing. It is nice to be able to get carried away with such dreams. Presumably, the possibilities for such a change in teaching procedure are too remote. Then, too, the many difficulties in timing the presentation of the program just when it is most appropriate make it probably unsurmountable.

What are some of the conditions that threaten the possible success of such an idea?

1. There is no television reception in the area served by the school.

   Today this may be so, but this article is written for tomorrow! COMSAT will do away with the need for coaxial cable, leased lines, microwave towers, and other transmission methods used today. What is COMSAT? That is the abbreviated name for the international corporation with the assigned control of the satellites that bounce transmission signals from any place on earth, to any place in space (where the satellite is stationed), back to any place on earth.

2. There are no television sets in the school, and the school is not equipped for television reception.

   This is an understandable complaint, but one that can be overcome. The need for antenna installed for proper reception, wiring to accommodate the electrical demands of the set, and heavy-duty metal brackets to support elevated equipment is about ended. Transistorized television sets operate on batteries and the telescope antenna comes forth whenever needed. The weight of the set is negligible.

3. There are television sets in the schools, but the specific programs envisioned for use in business law classes are not televised during usual class hours.

   Possibly these classes might be rescheduled for a time that is more suitable. Viewing of desirable television programs might even be assigned for homework. However, the injection of the word "desirable" implies that good planning should include a preview of the program *before* students see it. Is this possible?

The teacher of business law need not limit the use of television programs to the few with legal overtones. Actually, much of the content of these programs has no place in the format of business law topics. Scripts written for these programs rely upon problems of conflict, criminal intent, and unusual human emotions, all of which crowd out the references to civil law that comprise the real base of business law. Instead, the employment of a supplementary camera, such as the one designed for use with a television set, would equip the forceful business law teacher with a totally new teaching aid. This equipment would enable the teacher to "tape" visits to trials (mock, or otherwise when permitted) in such places as small claims courts, probate courts, superior courts, or appellate courts; in such settings as auctions, service establishments (dry cleaning and the like), hard goods sections of department stores; or with eminent members of the legal profession. The possibilities for such supplementary audiovisual teaching materials are beyond the imagination of any sole thinker; they are worthy of brainstorming sessions attended by many enthusiasts.

The injection of videotaped materials into the course of study planned for business law should be no different from procedures now used for the utilization of other supplementary teaching aids. Classrooms equipped with television receivers designed to accommodate taped programs will be a welcome relief for teachers who dislike the thought of complications now associated with other audiovisual equipment. Transistorized equipment even eliminates the need for a warm-up drill to occupy the attention of students while the machines are readied; the "On" button activates the set immediately.

Does the prospect of the cost associated with the equipment and necessary supplies still pose a formidable barrier? There is an answer for this too. Those who inaugurate the use of videotaped materials in business law classrooms merit recognition as pioneers in the field. Such a plan is strictly experimental at this time. There are funds available from outside agencies for such *creative* work. The federal government has sanctioned the allocation of monies under the National Defense Education Act for this and similar purposes (foreign language laboratories are an excellent example of the utilization of such appropriations). Such philanthropic foundations as the Ford, Carnegie, or ESSO Education definitely encourage experimentation through the endorsement and underwriting of the total costs for such projects. The $10.00 charge assessed by the Sloan Foundation for a copy of its compilation of all the known philanthropic foundations (Sloan Foundation Directory) represents an investment that could very well repay its users with astronomical yields.

TELELECTURE-PICTUREPHONE

Choose the names of a dozen authorities in the field of business law whom you would like to have as guest lecturers for a session or two of your classes. Such a list might include United States Supreme Court Chief Justice Earl Warren or one of his eight equally competent associate justices; former United States Vice-President Richard M. Nixon; former New York Governor and District Attorney Thomas E. Dewey; noted attorney Melvin Belli, the legal defender of Lee Oswald's slayer, Jack Ruby, and author of a number of books such as *Ready for the Plain-*

tiff and *What's Your Leg Worth?*; or master of detective fiction Earle Stanley Gardner, author of the "Perry Mason" series, and other stories. The very mention of any one of these names is enough to create wallflowers among the most stouthearted teachers in the profession; the aforementioned dignitaries include some of the most important men in the United States of America. To regain personal confidence, it is necessary to realize that every individual whom you might care to list is just another human. The most that can possibly happen negatively is the delivery of a polite refusal or a request for a prohibitive fee. Begin with the desire to "think big," and success with this particular dynamic technique is very apt to crown such lofty aspirations.

Given a topic to parallel an area portion of a unit in a business law course, would a well-known speaker from the outside world of business or law be able to contribute additional depth for discussions? Would an opportunity to question the speaker in more detail about his personal opinions provide firmer conclusions? Affirmative answers must be given to these questions if good teaching procedures have been followed throughout the use of traditional teaching methods. Once again, as in the case of the operation of conventional television equipment, such possible obstacles as distances separating the business or home residence of the proposed speaker from the location of the classroom, the rigid calendar of activities that most of these possible nominees adhere to, the monetary loss to the speaker incurred from this interruption in his business activity, or the timeliness of the lecture in terms of the portion of the unit under current discussion may act as drawbacks even if the desired dignitary would like to speak to the group.

Here, too, the method proposed to achieve this classroom meeting is new. There have been increasing numbers of instances of famous-person-classroom meetings, and enthusiastic endorsements of the method have resulted. How can such an assembly be arranged? Via *Telelectures!*

As the name implies, a *lecture* does take place via some version of a *tele*-medium. The American Telephone and Telegraph Company has enlisted the aid of its many communications subsidiaries and that of cooperating independent companies. Together, they make it possible to connect a speakerphone equipped with a tiny microphone and a miniature transmitter to a regular telephone. Transmissions are directed to receiving equipment tied to amplifiers in any assembly hall, classroom, or gathering place so that those on the receiving end can listen to the words of a speaker who is far removed from that location. The same system also makes it possible for members of the audience to direct questions to the lecturer for his prompt answers. The lecturer can address the group from the private confines of his office, home, court chambers, conference room, or his automobile, plane, or other mode of transportation; and, he never needs to appear before his audience in person.

Speakerphones have been used at Pace College (New York City) since 1962, permitting the classes at the college to hear and interview government, business, and professional leaders anywhere in the world (Horel, Bruce, "Live-Wire Lectures," *Saturday Review*, August 15, 1964, Vol. XLVII, No. 33, p. 49). San Jose City College (California) enlisted the cooperation of the editor and publisher of *Sales Management* magazine and a vice president of General Electric to conduct a three-way lecture-discussion in April 1964. Whereas the typical 50-minute telelecture at Pace College costs about $300, San Jose City College was able to operate its telelecture for $120 and at the same time share its expenses equally with *Sales Management* magazine and the federal government (monies available under the National Defense Education Act). The thought of telelectures as a new avenue of enrichment may excite the minds of innovators, but additional improvements in the offing for tomorrow are even more fantastic.

New "Picturephones" have been installed in five locations: Prudential Building in Chicago, National Geographic Society Building in Washington, Grand Central Station in New York City, the New York World's Fair, and Disneyland. These installations bear evidence of the fact that face-to-face conversations via the telephone are now a reality.

It will be possible by 1965 to see and hear a Telelecture with the aid of a Picturephone coupled to a Speakerphone. Amplifiers coupled with greatly enlarged phonoscreens will animate the far-removed individual's presentation of his opinions.

Where does this fit into the business law lesson plans of tomorrow? Those guest speakers now invited for personal appearances in classrooms, assembly halls, or other gathering places will be able to keep a much more flexible schedule. Teachers will be able to select from a wider choice of guests.

TRANSPARENCIES

The utilization of transparencies with overhead projectors and the preparation of these transparencies represent an avenue of communication with unlimited potentials. Constant improvements in the techniques of transparency reproduction have reduced technical difficulties to the level of taking pictures with a box camera. It is possible to make transparencies from almost any printed, written, or drawn original. The entire operation can be accomplished in seconds. The product that results is a transparency that can be used as a visual aid in any lesson using illustrations. The following are examples of some specific applications of visual materials that would enhance the teaching of business law.

The unit on real property offers innumerable generalizations. Students proceed from isolated point to isolated point without a true concept of the steps that are taken from the beginning to the end of a real estate transaction. A series of transparencies intended to portray the actual legal papers involved might contain reproductions of the following forms: individual office listing form, multiple service listing form, authorization to sell, advertising contract for featured listing and copy of ad, deposit receipt, preliminary report by title company, mortgage, mortgage with power of sale, deed of trust, quitclaim deed, warranty deed, grant deed, joint tenancy deed, installment note—interest included, authorization of request for reconveyance, deed of reconveyance, seller's statement and instructions, escrow instructions, and policy of title insurance. The knowledge of the teacher, the grade level of the students, the time allocated to the unit, and other similar qualifying factors would govern the circumstances.

As a discussion of "Law and the Court System" is developed, charts to illustrate the organization of the court system peculiar to the state in which the class is taught might be shown.

Selected clauses from a variety of contracts would illustrate how lawyers legally bind the parties once the contracts have been signed. Either the actual legal contracts or personally typed illustrations of agreements used to bind partnerships, sales transactions, agents, employer-employee relations, and other similar circumstances would enlarge the scope of the printed materials that appear in the textbook.

A transparency developed from one of the ancient partial payment notes, one in which each signature is cut out of the handwritten and signed notes that together comprised the entire evidence of the loan, would help to preserve the original document. Samples of negotiable instrument forms used in the local region, rather than the far-removed places that normally appear in the text illustrations, would heighten interest.

Improved communication between students and the teacher results when the eyes have a chance to help the ears understand what has been said.

COMPUTERS

When the subject of computer instruction is mentioned and discussion centers about specific courses, the practical applications suggested seem to be (1) classes in the preparation of key-punched cards or impulse recordings on a magnetic tape, (2) classes in the utilization of output for the solution of mathematical problems, or (3) the maintenance of records. Computers as automated employees for the legal profession are already being tried.

Systematic inquiry, commonly known as research, performed by lawyers as they prepare arguments designed to sway the opinions of the court, relies upon some system of information retrieval. Reduced to a system of numbers, programed into the memory of a computer, and available to those who have to perform the search, exisiting references to the law that apply to a particular circumstance can be located in a matter of seconds. The merits of computers, plus the logic of why it is necessary to acquire a greater knowledge of legal terminology, could enhance the study of business law. The secretary in the law office of tomorrow who has taken courses in business law and who has a fundamental comprehension of how to locate legal references quickly with the aid of computers will truly approach the status of a partner in the law office.

The added series of exercises designed to explore the methods used to locate quickly all references to selected legal principles should teach the fundamentals of data processing more effectively. The skills developed in one class (data processing) can be tested in another class (business law). Possession of the skills needed to prepare the files (cards or tape) need not be a prerequisite for assigned work on data retrieval.

Assignments developed for key-punch operators who are learning this skill in one class might require these students to index a hundred or more references to specific bodies of law that appear in many different source books. As an example, the Statute of Limitations is defined under the section known as termination of contracts, applied to the many classes of contracts that appear in successive chapters of every business law textbook currently published. Similarly, references are made to such topics as usury, statute of frauds, and responsibilities of parties. The key numbers used in the storage of such references are guides for the retrieval of this information in exercises designed to make these references necessary. Logically, the introduction of actual law cases for briefing and decisions, in terms of the references that have been programed previously, would advance the level of knowledge needed to justify decisions.

Ideally, the preparation of programs for the actual cards or tapes by publishers of business law textbooks would dispense with the rote drills now found in workbooks. Assigned time to locate quickly the references to a series of questions compatible with the data in the computer would enliven interest and truly train students for the world which they will eventually rule.

The next step beyond the use of cards or tape for the storage of law references will be that of videofile. Employment of the same methods used to transmit pictures taken of the moon by Ranger VII will make it possible to actually view and read the decisions previously filed electronically. Law libraries will be available to those who wish to do research and who know how to use such supersophisticated systems. This is a long way from the business law classes and teaching techniques in use now, but the business teacher who wants to keep abreast of tomorrow must begin to recognize that the textbook-lecture approach is outmoded. The challenge of automation faces business law, too.

PROGRAMED INSTRUCTION

A search for programed materials for instruction in business law will determine quickly that no such items are on the market today. Should this method be dismissed as a possibility simply because such materials have not been published? Certainly the answer should be an emphatic *no;* otherwise new teaching materials would never be produced. Programed instruction is nothing more than the systematization of an excellent teaching procedure. The development of programed materials by a business law teacher, whether they are intended for a unit or the entire textbook, could lead to something that could be shared readily with other teachers and at the same time yield a profit.

An example of a group of lessons that might be programed in business law might be the one which deals with the primary and secondary liability of parties to negotiable instruments. Most teachers come to a lesson with a clear idea of the questions they desire their students to be able to answer when the lesson is ended. These are key questions—they determine whether the lesson is learned as well as understood. Programing is a way of questioning students throughout a lesson and achieving correct responses when the questions are properly interpreted by the students. The development of a series of questions that progress from a review of the meaning of liability to the application of the term primary liability, to the nature of secondary liability, and eventually to the proper assignment of liability to different parties under varying circumstances could apply the principles of programed instruction.

Once the trial lesson has been conducted in a small area of business law subject matter, it should be a relatively easy step to select other business law topics that lend themselves well to the development of programed instruction units. Until these initial steps are taken by some individual who wishes to program instruction for business law, the marketplace will lack these items in its stock.

FILMS AND FILMSTRIPS

The following films are among those currently listed by Business Education Films as suitable in part for business law:

The Check Collection Process
Pay to the Order of
Before the Day (History of Social Security)
The Structure of Unions
A Voice in Business (Corporation Meeting)
Your Employment Insurance
Purchase of a Second-Hand Auto
Our Constitution
Basic Court Procedures
Common Law
Country Magistrate
English Criminal Justice
Law and Social Controls
Man on Trial
Our Basic Civil Rights
Practice Courtroom—Fell vs. Manlock
Problem Clinic
Procedure in the Traffic Court
The Supreme Court
Traffic Court
Trial by Jury
Trial—The Case for the Defendant
Understanding the Law
Village Notary
What Is a Contract
What Is a Corporation
Why We Respect the Law
With Benefit of Counsel (Color)

The following films are among those currently listed by the Insurance Information Institute as suitable in part for business law:

Casualty Insurance
Not Around the Block (History)
Above and Beyond (Underwriters)
Danger Sleuths (Underwriters' Lab)
The Magnolia Story (Underwriters)
The Wind and the Fury (Adjusters)
Dollars and Sense (Jury Awards)
The Secret Service Story (Forgery)

CHAPTER 12

Applications of the New Media In Secretarial Office Practice

SHARON McNUTT JACKSON, Washington High School, Fremont, California

How can the new media be applied to prepare more capable secretarial novices for business? In order to answer this question we must ask first: What skills, knowledges, and understandings are necessary for today's secretary? Furthermore, which of the outcomes may be achieved best through the use of the new technology and media? We must consider also the changing role and routines of office work that have special implications for a finishing course for secretarial students.

Some desirable skills, knowledges, and understandings needed by today's secretary are summarized here. These are outcomes which lend themselves to situations where the new technology may be applied to speed up or make easier the achievement of these objectives.

1. The strengthening and further refinement of basic typewriting, shorthand, and transcription skills to a level required for successful performance in a satisfying entry job.
2. The development of skills, knowledges, and understandings of office functions and business procedures in order to form a foundation for further training and job advancement.
3. The development of necessary personality traits of dependability, accuracy, initiative, cooperation, and a willingness to assume responsibility.
4. The understanding and practicing of effective principles of human relations.
5. The development of further basic computational skills and increasingly effective skills in communications.
6. The appreciation of the role of the office in today's business world and the necessity for the orderly, efficient operation of office functions and operations.
7. The development of an awareness of the unfolding role of automation, especially of its applications to and implications for the office.
8. The understanding of the role of change and the development of a willingness and facility to change, train, and assist the orderly implementation of automation.

9. The development of a more thorough foundation of business understandings and economic knowledge.
10. The gaining of an understanding and some knowledge of the role of supervision and minor administrative matters.
11. The gaining of an understanding of the need for further education and training and greater production if one expects advancement.
12. The stimulating of a quest for knowledge of business procedures and principles for its own sake and as one of the avenues to advancement.
13. The development of a familiarization with commonly used office machines associated with the performance of usual office tasks, including some introduction to basic automated equipment.

In summary, then, the major objectives of the secretarial office practice course are to develop those skills, knowledges, and understandings, beyond the basic typewriting, shorthand, and transcription skills needed by the student to perform successfully in a satisfying entry job, and to form a foundation for further training and advancement.

The secretarial job of today includes considerably more than typewriting and shorthand. Today's secretary needs a broad general education in order to perform her job and to understand the changes that progress, and especially automation, will bring. The secretary must possess the skills, knowledges, and initiative to perform her own work with little direction. She must also know how to supervise others effectively, for in many offices, secretaries are devoting less time to routine work and more to minor administrative responsibilities.[1]

Today's secretarial office practice course must include more variety and depth of content than ever before in order to prepare students adequately. Much help is available in achieving this task. Applications of today's technology open new approaches to make secretarial office practice more meaningful for the stenographer and secretary of tomorrow. The purpose of this chapter is to present some suggested applications to illustrate the use of new devices and techniques as they may be related to certain phases of secretarial office practice.

PERSONALITY FACTORS

Bringing actual office situations into the classroom can illustrate to students the wide range of needed skills as well as stimulate the development of necessary personal traits, human relations skills, and occupational intelligence on the part of the student. Televised video-tapes provide a medium to bring the world of business into the classroom. In this way, successful secretaries demonstrate how they accomplish their work in an efficient and orderly manner. The employer-secretary-dictation situation may serve as an example of the way in which meaningful concepts might be presented through a video-taped telecast in the classroom. Some concepts that might be illustrated in such a situation include (a) the dress and manner of a secretary, (b) an effective human relations pattern, (c) correct dictation and transcription routines, and (d) an awareness of time, motion, and order in the secretary's production. For example, the taped illustration might open by depicting the dress and poise of the secretary as she enters the inner office of her employer; the human behavioral pattern could be observed as the cooperative relationship is established without time-consuming "chitchat." Students could measure the secretary's confidence by the calmness with which she takes dictation, notes instructions, and makes insertions. In the final moments of the scene, the students literally can see how the orderly arrangement of the secretary's desk and the organization of the working area contribute to increased production as she follows the transcription routine.

---

[1] Anderson, Ruth I. "Desired Outcomes for the Building of a Foundation for Advanced Study." *New Perspectives in Education for Business.* National Business Education Yearbook. Washington, D. C.: National Business Education Association, 1963. p. 240.

With a little imagination, it is easy to conceive how local offices and former graduates might play starring roles in other job situations to provide learning opportunities for students. For instance, other situations which could portray important concepts and fitting video-tape subjects include a receptionist greeting a salesman who has no appointment, a stenographer receiving correction and training from the supervisor, or an interviewer discussing with an applicant her qualifications for a secretarial position.

Similarly, a field trip to view the dramatic changes taking place in the office now can be accomplished without leaving the classroom by utilizing video-taped telecasts. Among other suggestions, Dorothy Brown[2] has described two field trips especially applicable to developing students' understanding of the changes occurring through the use of the newer office machines and the need for accuracy and thoroughness. In one instance, an international seed distribution company office illustrates how only two persons can handle the dictation of ten men with the use of dictation machines while another employee handles routine correspondence by operating three automatic typewriters to produce hundreds of form letters daily. In the other example, data processing is featured in a frozen food plant where key punching, verifying, sorting, collating, reproducing, and accounting machines operations are illustrated and demonstrated. Through the use of video-tapes in this way, the values of field trips may be realized and personality factors observed (perhaps even more effectively since viewers actually see what the instructor intended them to see) without the scheduling and transportation problems usually encountered in carrying out this type of activity.

---

[2] Brown, Dorothy L. "General Clerical Field Trips." *Business Education Forum* 18:23; October 1963.

Another example of giving increased effectiveness to an "old" device by applying the new media could be the teaming of role playing and video tape as in the interviewer-applicant situation. Students could test their own behavior through immediate viewing of their role-playing performances captured by the television camera on video-tape. In one instance, students could experiment with and then compare different ways to present their qualifications and to exhibit their poise and skills. In addition, a better understanding of the role of an interviewer might result as student interviewers test ways to draw out the personality and qualifications of the applicants. But the major value of students being able to view their own role-playing lies in the fact that the performers themselves would be able to evaluate their appearance, manner, even production, as it would appear to an employer, supervisor, co-worker, or office visitor.

DESK SYSTEM

A teacher-made slide series may be an effective device to present instructional topics such as desk arrangement and procedures because the collection may be tailored to the precise situation and reflect the instructor's own personal touch. In this instance, a series of 15 to 20 slides might be used to develop students' skills in creating desk arrangement in order to increase their job production. A few scenes of the efficiently organized desks of a boss and his secretary could provide a basis for preliminary discussion of the contribution of a suitable arrangement of working materials and supplies to job production. These scenes might emphasize how frequently-used supplies and tools are kept within arm's reach. Then the series might present a collection of illustrations of past students' attempts to create a desk routine of their own; these tableaux could serve as a basis for analysis by the class and to stimulate students' efforts in developing their own most efficient routines.

Other instructional topics suited to presentation through a teacher-made slide series might well include business forms used in different types of offices, illustrations of various filing systems, and examples of appropriate office dress and grooming. Articles in business education literature will come to the aid of the teacher who seeks other ideas and instructions in developing a slide series of his own.[3, 4]

OFFICE MACHINES

Reports of the successful use of televised typewriting and shorthand instruction abound in the current literature. But how many of us have considered applying closed-circuit television to the demonstration of office machines? In one case, the television camera may be used effectively to overview the business machines students will be learning to operate. For instance, the teacher could demonstrate correct touch techniques on the ten-key adding machine as well as point out similar and differing features of various models; or, by borrowing machines from suppliers, an overview could present additional features of different makes or specialized models of similar machines.

A well-planned overview or demonstration of office machines could be presented in terms of a video-tape telecast, filmstrip, or slide series. Any one of these devices might be used effectively, for example, to present the steps in the preparation of a mimeograph stencil. Such a presentation could include preparation of a rough layout of the material, cleaning the type faces of the typewriter and disengaging the ribbon, setting margins, cutting the stencil, making corrections, and using a mimeoscope to add a picture or diagram. A similar demonstration could follow with the actual operation of the mimeograph. The steps in this demonstration might include the following: uncovering the duplicator, releasing the brake, removing the protective cover, installing the stencil and paper supply, running the trial copies, making adjustments and adding ink if needed, setting the counting device, running the needed copies, and keeping watch on the quality of the work being done. The final steps of the demonstration would involve cleaning the machine and work area, replacing the protective cover, setting the brake, covering the machine, and either destroying the stencil or preparing it for storage.

If a televised overview is used, the telecast may be presented "live," of course, but any demonstration which will be repeated in subsequent classes can be used to best advantage if it is taped for reuse. The taped demonstration may then become a device for class review, for group instruction in a rotation situation, for individual reinstruction, or for self-instruction in the case of an absentee student. One excellent demonstra-

---

[3] Kalbaugh, A. J. "Let Slides Tell Your Story." *Business Education World* 40:26-27; September 1959.

[4] Lanza, Anthony R. "Overhead Projector Slides: Do It Yourself or Ready-Made." *Journal of Business Education* 35:137; December 1959.

tion on tape can be duplicated and distributed to all the schools in a district or geographical area for use at appropriate times. As more and more schools utilize the advantages of the different forms of the new technology, one of the needs that has developed is for professionally developed materials and devices such as those described above.

Although the time given to office machines varies from teacher to teacher and depends upon the individual curriculum of the school, it is customary to add to the family of skills already possessed by the student. If students have not had any previous training in this area, the advantages of programed learning materials may well be one key to adding to their individual skills. Such materials used in this way assume a good deal of individual pursuit; also, programed matter is generally limited to areas that involve memorized or skilled learning. In the case of office machines their use may be particularly suitable. There is certainly a need for more research in this area and, if indicated, the development of more programs for use with instruction of skills on office machines.

The controlled reader and its specialized filmstrips offer another application of new media to the area of office machines instruction and the related development of fundamental computational skills. One of the first developed series of learning aids for use with the controlled reader in machines instruction is a ten-key touch training course which emphasizes both basic concepts and correct techniques. The controlled reader allows the teacher to pace the rate of both the presentation and practice by simply resetting a dial to control the speed.

In the area of strengthening basic computational skills, one of the objectives of a capstone course, the controlled reader filmstrips offer a series in both basic business arithmetic and in "mental arithmetic." It is probably the latter that would have the greater application in a course where computations of a business nature are being performed already on adding and calculating machines. The student's skill in mental computations is closely tied to his skillful performance on machines, for one of the steps that should be developed in machine operations is the *mental* one of rapidly estimating an answer to a problem as a check on the operator's entries.

TRANSCRIPTION SKILLS

In the transcription development phase of the course, the emphasis probably will be upon increasing the student's working vocabulary and experience with different tasks. The teacher will want to provide a wide range of assignments in order to suggest to the students just how varied are the duties of a secretary. For instance, some kinds of office problems which should be included might be office-style dictation, travel itineraries, short inventories, minutes of meetings, and business reports which include information to be organized in some tabulated manner.

Certainly, the area of further shorthand and transcription speed building is a main concern of both the teacher and student in advanced training. If the available school resources include multiple-channel dictating equipment, backed up by appropriate records and tapes, then these facilities would be used in group or whole-class activities for further skill building. But the inherent nature of this type of skill building emphasizes individual pursuit; thus, the majority of this kind of skill building activity probably would be accomplished by the use of records or tapes assigned on an individual basis. Needless to say, the direction of each student's pursuit, whether intensive practice for speed building or extensive for broader vocabulary development, would be individually determined according to need.

Machine transcription skills will probably be an objective of the secretarial office practice class. The student will need familiarization with the various types of machines: the plastic or magnetic belt, disks, and magnetic tape types. Televised video-taped instruction once again offers a medium to present the different types and features of each of the kinds of dictation-transcription machines used in the local community. The setting for such a demonstration might be right in the showroom of a supplier if the objective is to demonstrate the newest developments and types of this equipment. Besides, would it not be better to substitute that lengthy set of mimeographed instructions of "Steps in Machine Transcription" with a short video demonstration that tells and shows the student just how to operate the machine, listen for transcribing cues, and set up a mailable letter?

FILING

Programed materials offer special advantages for courses involving simultaneous rotational learning activities as secretarial office practice often does. In units where the subject matter is of a memorized or skilled nature, as in the filing unit, programed instruction can be used as a basis for self-instruction or a whole-class activity (or even an outside-class activity); yet the programed instruction provides each student with the opportunity to work at his own rate in learning filing principles, procedures, and special techniques. This type of instruction frees the teacher to give individual assistance or special direction. If some other instructional method is employed, the programed materials have value as a recourse for remedial review and drill. Through the self-instructional nature of such materials, the late enrollee, the absentee, and the slow learner may each receive the individual instruction they need to fit into the whole-class activities or to maintain the usual pace of the course without diverting unnecessarily the teacher's attention from the rest of the students.

The controlled reader provides another approach to the filing unit through filmstrip exercises designed for whole-class activities or small group study. The filmstrip series of the controlled reader emphasizes the development of rapid mental reaction to exercises of filing facts and to applications of filing principles. The integrated use of controlled reader aids and programed (self-instruction) materials in a filing unit provides a real opportunity for students to progress on both an individual basis and through teacher-directed, whole-class recitation. This combination of applications of the new media in instruction would seem to balance neatly the double-edged educational goal to allow students to learn at their individual rates (an especially important consideration in a subject like filing where there is such a wide spread in the rate of learning among class members) and to provide competitive, paced recitation to serve as a measurement or evaluative instrument of student progress.

There is a need in the filing unit for a well-developed film, filmstrip, or video tape for motivational and occupational intelligence values for use in secretarial office practice. Such a presentation could emphasize the vital role of files in today's business and demonstrate this role with illustrations of different filing systems and the functions they perform. The files in a legal office might be used to emphasize the confidential nature of the secretary's role as well as the type of recordkeeping that a secretary may perform in making up statements of account and in handling payments. The types of records in a medium-sized medical center could illustrate the additional importance of accurately recording personal data, the confidential codes used to identify the type of treatment, and the charges for the type of service rendered. A large company's office might be used to demonstrate the importance of records in production control, maintaining inventory, purchasing, and shipping of completed orders. Or a large government agency such as the Internal Revenue Service or the Social Security Administration could serve to illustrate the need for and advantages of automated filing systems. Students should see how records today include such forms as punched cards and paper tape or magnetic tape in order to make use of computers for information retrieval. Current innovations, such as the system that incorporates microfilm and punched cards to provide for both manual and automated processing, should be presented in order to develop the concept that ways to keep information and the very nature of records themselves are changing rapidly.

OFFICE COMMUNICATIONS

The areas involved in written messages are those in which many students need additional skill building since one of the secretary's primary responsibilities is the skillful management of communications, often including the composition of replies, at least to routine correspondence. Certain aspects of written communication skills can be presented with available programed materials. In this topical area there is a programed-style workbook, designed primarily for use at the typewriter, containing fifty, 15-minute lessons for a review of spelling principles and their applications. In the area of punctuation, an example of currently available programed materials is a book, taking an average of only three hours for the student to complete, which presents the major uses of the comma.

Punctuation may be presented also through overlays for the overhead projector. The use of colored overlays with transparencies to mark dependent clauses to demonstrate changes in meaning is a useful application.[5] For example, a sentence may be projected as this:

The employer says the secretary is very punctual.

An overlay inserts commas to demonstrate how punctuation alone can revise the sense of the meaning in this example:

The employer, says the secretary, is very punctual.

In most cases punctuation would probably be only one topic of a larger unit such as letter writing. The opaque projector offers applications to this larger unit. Besides displaying sample letters to illustrate the different types of letters such as sales, collection, requests for information, etc., the most convincing use of the opaque projector comes with immediate follow-up through projection of letters composed and typed by students. The display of student letters allows class examination, comparison, and constructive criticism. All students can evaluate the appropriateness of the communication of the message, as well as the placement and typing techniques involved in the finished product. Similarly, letterheads can be projected to illustrate types, placement, and color in this aspect of communicating a firm's business and setting a tone for its correspondence.

---

[5] Holland, Josephine, and Lambert, Allie Dale. "Shorthand and the Overhead Projector." *Business Education Forum* 17:18; March 1963.

The secretary of today is often responsible for the production of many kinds of business reports. For this reason, students should learn to include special displays such as tabulations, charts, and diagrams. The opaque projector, again, may be used to present and review correct styles and placement of quotations, footnotes, page numbers, headings, title pages, proofreader's marks, and so on. Projection may serve to illustrate how the same material may be presented in tabulated form, a bar graph, line graph, or pictograph, depending on the purpose of the report. On the other hand, different styles of special displays can be illustrated through the use of overhead projector transparency overlays. For instance, some tabulated material could be shown first in open style. An overlay of horizontal rulings would illustrate how headings and totals may be emphasized; another overlay of vertical rulings could emphasize columnar content. All together the overlays and the base transparency serve as an example of the boxed style of a tabulated display. Similar examples could be constructed to emphasize the use of color in reports and displays for presentation with either the opaque or overhead projectors.

Although the above examples are described primarily in relation to use with the overhead and opaque projectors, they could, with few changes, be presented just as effectively in terms of filmstrips, slide series, or televised demonstrations depending upon the type of equipment available to the instructor.

A LOOK AT FUTURE NEEDS

Research studies have shown that the instructor is the most important factor in the learning situation. He will continue to be. Planning seems to be the key to the instructor's effectiveness in meeting his responsibilities;[6] only when the applications of the new instructional media are carefully planned do they increase the effectiveness of both learning and instruction. Each device or technique must be evaluated carefully by the teacher in terms of its built-in purposes and special contribution to the specific learning situation. With each application, the teacher must ask himself two questions about the contribution of a specific factor: "First, does it help? and second, is it a more effective way to spend instruction time than some alternative way?"[7] In the final analysis, each new device is just "hardware," or a tool of the teacher. Successful application and continued development of educational technology hinges upon the creative responding mind of the classroom teacher who asks, "How could this outcome be accomplished more effectively?" and then defines a need for even newer devices and more dynamic techniques.

---

[6] Musselman, Vernon A. "Improving Teaching Through Planning." *Business Education Forum* 18:7; December 1963.

Business educators have the opportunity to be among the pioneers in developing and applying the new technology to even newer possibilities which are appearing on the horizon. For instance, teaching machines will soon show as well as tell. Lumsdaine[8] foresees the time when teaching machines will also include individual films and filmstrips with flexible start-stop points as an integral part of the program. In fact, perhaps one appropriate means of incorporating films into teaching machines may already be at hand, for as Robinson[9] reports, "One of the most exciting promises in the audiovisual field is the emergence of 8 mm sound film." This development may be teamed with programed instruction in the future to produce the kind of complete instructional package which both Lumsdaine and Robinson, each in his own way, have foreseen. What promise such "packages" hold for secretarial practice, for example, in learning skills in business machine operations or filing!

Further applications of the new media call for educators willing to "pitch in" with the creative imagination and extra effort required to open up and develop any frontier. For instance, in regard to educational television, Robinson has stated:

> Because the art of TV instruction is in such an early stage, there is a complete dearth of such skilled individuals. Thus, this major education advance is limited in rate of growth to the rate at which educators can be trained for this purpose.[10]

The same kind of observation may be made about the realization of the promises of other phases of the new media as well. Yet through the efforts of some pioneers, more and more of the current professional literature contains reports and evaluations of instructional programs applying the new media.

---

[7] Lumsdaine, A. A. "Instruments and Media of Instruction." (Edited by N. L. Gage.) *Handbook of Research on Teaching—A Project of the American Educational Research Association.* Chicago: Rand McNally Co., 1964. p. 612.

[8] Lumsdaine, *op. cit.*, p. 589.

[9] Robinson, Charles. "Audio Visual Teaching Aids: 8 mm Sound Film." *Journal of Business Education* 38:72-73; November 1962.

[10] Robinson, Charles. "New Horizons for Educational Television, Part II." *Journal of Business Education* 38:162; January 1963.

Let us respond also to the present need for more professionally developed and prepared materials of all types, integrating the best and most appropriate of the new media, tailored to fit and make our work easier in secretarial office practice. Let us *develop* and *distribute*, on a wider basis, well-prepared video-taped demonstrations, transparencies, films, slides, filmstrips, recordings, and self-instruction programs especially designed for effective learning. Let us continue to seek creative applications of the new media to make our instruction more effective and students' learning more productive. This is the challenge of the applications of the new media in secretarial office practice.

CHAPTER 13

New Media in Teaching Business Machines

Robert J. Thompson, Foothill College, Los Altos Hills, California

New media in teaching business machines calls for optimistic foresight. Business machines are used to accumulate pertinent data and to distribute the information from source to resource file. Business machines perform the calculating function of multiplication, division, subtraction, and addition. From the time that the first abacus was developed to the current automated equipment, the function has remained basically the same. The media for performing the function, however, have taken a variety of avenues.

An advertisement in a recent issue of *The Office*[1] placed by the Tomoe Soroban Co. of Tokyo, Japan, describes its calculator as: "Made of wood and bamboo, unit is used for the calculation of figures based on the decimal system and common notations. Abacus speeds figuring and can be used to add, subtract, multiply and divide. Model is handy, inexpensive, portable and can be used in a short period of learning time for everyday calculations."

In contrast to this basic device, two other manufacturers made these statements about their business machines: ". . . in addition to performing calculations without manual re-entry of intermediate results, it can automatically accumulate individual sums and products for a grand total—or hold them until they're wanted as elements in additional calculations. It can provide a constant dividend without manual re-entry. . . ."[2] and ". . . it uses its own Veeder Counter to keep track of precisely how many multiplications you've made. Automatically retains the multiplicand you've entered to be used as the multiplier in squaring. (All you do is press the multiplication keys.) Won't even trust you to work with a dollar and cents keyboard—provides you, instead, with a statistical color-coded keyboard. In squaring a second set of dials records the last number squared. In division, it provides you with individual answers while the larger dials are simultaneously accumulating."[3]

---

[1] *The Office*, 73 Southfield Avenue, Stamford, Conn., November 1962. p. 166.

[2] The Divisumma 24 Grand Total, Olivetti Underwood Corporation, One Park Ave., New York.

Manufacturers' claims are so grand regarding existing equipment that the teaching of touch systems and a high degree of skill in operating a variety of machines appear obsolete. The simplified keyboards and the multiple automatic keys on today's equipment make the functions to be performed on the equipment of major importance. The print-out tape of the printing calculators provides the checks and balances in teaching business machines.

WHAT HAS BEEN DONE

Instruction in business machines is usually offered under one of the following patterns:[4]

1. *Battery.* The battery plan necessitates the purchase of machines of the same kind such as one make of key driven machines. A room equipped in this manner permits the development of many expert operators on one type of office machine.
2. *Rotation.* The rotation system provides for instruction in the operation of a number of different types of office machines and devices. Each student receives enough training to familiarize himself with the operation of each machine and develops a reasonable amount of operating skill. Mastery of any particular machine would usually be accomplished on the job in business, but it could be acquired in the classroom if particular adaptability toward a given machine is developed during the course. The student receives instruction and learns to operate one kind of machine. After some operating skill is acquired, the student is transferred to another kind of machine where the learning process and skill development are repeated.
3. *Integrated.* This program of instruction in business machines is developed through the medium of a well-equipped and well-organized office. Here, students are assigned to such positions as inventory clerk, supply clerk, file clerk, bookkeeping machine operator, or similar jobs customarily performed by office employees. Tasks are designed to fit the jobs handled in offices, and these tasks are performed in the actual way they would be done in the office. Machine instruction is applied to the tasks to be performed, and each job is designed to include the areas of operating skill in which the learning process and skill development must take place. Fully integrated business transactions flow from the point of receipt of orders, through the recording process, past the point of shipment, to the receipt of payment. When accuracy and skill are sufficiently developed, students are then assigned to different positions; by the end of the term or year, students have experiences in the types of office jobs detailed for this program.

---

[3] The Monro-Matic 8f-1, Monroe International, Inc., Orange, New Jersey.

[4] Beckett, Alvin C. "Developing the 'Whys' and 'Hows' of Office Procedures." *National Business Education Quarterly* 27:43-46; December 1958.

WHAT IS CURRENTLY BEING DONE

The "how to" of machine calculation is receiving attention today. The former stress on the manipulative skill in handling a particular piece of equipment has given way to the utilization of the equipment. A desk calculator of today is a kissing cousin to a computer. The theory that the student learns on the desk calculator will apply to the functions to be performed on the more sophisticated computers. The hardware to achieve the finished calculations has been improved from the time of the first abacus. It still takes a relatively short period of time to master the hardware, but it takes patience and understanding to master the theory for most effective use of the equipment.

Teachers and educators are asking themselves questions about the traditional methods of teaching office machines. The following question facing business educators was recently submitted by E. L. Marietta.[5]

> Will business teachers continue to teach only the traditional business machines such as the ten key and full-bank adding machines, the rotary and key driven calculators, the printing calculator, bookkeeping machines, or will they include some form or degree of automation in this program?

Business machine operators need a broad, general understanding of the principles involved in the processing of data; a knowledge of modern techniques and methods in handling of data; and a basic competence in the application of systems of electromechanical and electronic data processing equipment. The emphasis today is upon the development of a broad, general understanding of business data processing. This includes a familiarity with a wide spectrum of equipment and a knowledge of the possible uses of available machines.

THE OLD AND THE NEW

The evolution from the slow manual systems to speedier controlled mechanical methods has taken place in the past century. The volume of paper work has grown faster than the capacities of most existing systems and costs have risen commensurately. In 1900, one out of every 40 employees was engaged in clerical work. Today the ratio has changed to one out of six. According to Terry,[6] the modern office worker spends 20 percent of his working time performing the calculating function. Management everywhere is vitally concerned with this activity.

The key driven calculator and the full key adding machine are much too slow for today's business. The speed of modern calculators is measured in milliseconds as evidenced by Friden[7] Model 130 electronic calculator. It has no moving parts, just a ten-key keyboard. A cathode ray tube-like miniature television screen displays the contents of its four registers. Friden claims that anyone can learn to use it in a few minutes. The operation is instantaneous, and it is considered to be a desk top calculator.

---

[5] Marietta, E. L. "Newer Developments in Teaching Media with Implications for Teaching Office Machines." *NABTE Bulletin* 78, 1963.

[6] Terry, George R. *Office Management and Control.* Homewood, Illinois: Richard D. Irwin, 1962.

The card punch operator and the sorter are being bypassed before most organizations have had the opportunity to install this type of equipment. The processing is being done on tabulating equipment; a tape-to-card converter is used with the direct input on a by-product tape from the source of original data.

The familiar ten-key adding machine, when equipped with a punched paper tape recorder, can produce valuable reports in such departments as receiving and shipping, sales, audit, inventory, accounts payable distribution, expense analysis, payroll and related distribution, department sales reporting, markups and markdowns, and purchase order analysis. The utility and the applicability of computers are being continually enhanced. It is for this reason that persons employed in the secretarial and clerical field should become well informed about the field of data processing and systems as well as machine operation.

The extent and the future development of office automation is not generally known. Some general observations seem to be clear. The California State Department of Education, Bureau of Business Education, released the following observations:[8]

1. We must consider any automatic or nonmanual process used in the office which may have some bearing on the trends and requirements for employment.
2. Newly developed business machines, especially of the more nearly automatic type, are reducing the need for some personnel who previously performed routine office tasks.
3. There is a growing need for high-level technicians who have the ability to do logical thinking.
4. The role of the secretary in an era of automation will be to update her background for specific jobs such as machine operation—within the framework of a broad treatment of business data processing.

---

[7] Friden 130 Electronic Calculator, Friden, San Leandro, California.

[8] Eight observations taken from the California State Department of Education, Bureau of Business Education, "Report of Conferences on Office Automation." (Unpublished.)

5. Basic skill used in typewriting and ten-key machines can be adapted to most automated equipment.

6. A sound human relations program that makes the best possible use of the people who will always be needed to staff and manage the automated offices is of prime importance.

7. Young men and women are needed in the automated office who are able to think creatively, exercise logical judgment, and evaluate constructively.

8. Electronic calculators and data processing machines do not purport to be equal to the human brain. The routine output of these machines may excel in speed and accuracy; however, they work under the direction of trained minds who prepare, program, and analyze the data.

In offices we still need more clerical workers and machine operators. Many of these people will be typewriting on essentially the same kind of keyboard as they use on the typewriter, in order to put the information into machines, on tapes, or on punched cards. Some people will be needed to file this information. A new skill is needed in coding, but coding requires understanding. It requires a knowledge that will permit the changing of names and figures into codes that will go onto cards, tapes, or drums to be used for other processes.

When information comes out of the machines that have been fed the raw data, it still has to be arranged in accounting reports, sales reports, and inventory reports just as we have them today. The end results are not changed, but the processes are changed. We still need to know what those processes are.

There is an increased need for an understanding of the entire processes of an office. There is an increased need for accuracy because if one error is made in automation, it will be carried through an entire process. It will also be increasingly important for secretaries to learn how to follow instructions and to understand why certain operations are necessary. The business machines course can be most beneficial in training for this need.

IMPLICATIONS FOR OFFICE EMPLOYMENT

Electronic data processing serves both to create and to eliminate jobs. Among the created jobs are the jobs developed for the operation of the EDP system and jobs of all types created by the computer's capacity to turn out more information and more kinds of information than have previously been possible. While the computer saves labor, it also performs new functions, and the net effect on employment depends upon the balance between the two. Some evidence is available that shows EDP exerts a braking effect on the expansion of office employment.

The Bureau of Labor Statistics study of 20 offices revealed that employment increased an average of 7 percent in the 17 offices for which data were available in the four-year period covered by the study. This was about one-half of the 15 percent increase which occurred for all clerical workers in the United States during the same period. A recent Bureau analysis of the occupational outlook in banking concluded that the total number of additional employees anticipated by 1970 would be 13 percent less than it would have been without electronic data processing. These are some evidences of what analysts refer to as the "silent firing" effects of EDP.

In contrast to this apparent impact on the number of jobs, studies indicate little evidence of any significant number of layoffs resulting from the installation of the equipment. The long time required for installation from the planning stage to normal operation, averaging three years for the larger systems, enables employers to take advantage of high rates of turnover and to retrain and reassign numbers of displaced workers. In most instances, the total number of layoffs was negligible.

Office automation all but eliminates the necessity for hiring large numbers of temporary employees for periodic large scale routine data processing work. With the use of electronic data processes, microfilm, and an optical sensing device, the Bureau of the Census was able to process the 1960 Census of Population returns with less than one-half of the staff required for the 1950 census.

IMPLICATIONS FOR OFFICE OCCUPATIONS

Case studies indicate that the introduction of a large computer into an office reduces the need for routine clerical jobs and routine data processing jobs. Such occupations involve posting, checking and maintaining records, filing and calculating, and also some machine operations, such as tabulating. Experience with office automation indicates that, as in the blue collar field, white collar workers with minimum skills may be finding their jobs more precarious and their employment prospects more limited, unless they upgrade their skills with additional training.

Secretarial, stenographic, and typing jobs have not been much affected by electronic data processing. Such jobs, accounting for one-fourth of the total white collar employment in 1960, are expected to increase rapidly during the present decade. Of the three, typing occupations are expected to show the least rise due to elimination of much routine typing by new duplicating devices.

Studies of the impact of electronic data processing on clerical skills show that some of the more skilled occupations and some supervisory jobs are also displaced. One such study found that compiling reports, reviewing accounts, and deciding amounts and dates for reorders were among the more skilled functions affected.[9]

Displaced routine clerical workers generally do not have the qualifications for work in the electronic data processing units. In the 20 offices studied by the Bureau of Labor Statistics, less than 2 percent of the 2,300 in the affected units were transferred to electronic data processing units. Most of these had been performing administrative, accounting, or tabulating machine work.

Nevertheless, at the time of installation, electronic data processing personnel are generally selected from existing staffs—some knowledge of the business is considered an important qualification. They tend to be chosen, however, from employees engaged in types of work closely related to their new occupations. A large proportion of the selectees have higher education. Most of the offices use standard tests of learning ability and numerical aptitude to screen applicants for these positions. Ability to reason and think logically appears to be a prime requisite for programing and systems work. Employees chosen are mostly young persons and they are predominantly male. Shift operations appear to be common in the departments because the computer can be used most economically on an around-the-clock basis.

Surveys reveal that about two out of three persons in electronic data processing work were in programing and planning positions. Most of the remaining one-third were engaged in operating the equipment, and the remainder were in administrative and supervisory positions.

Because of the newness of the jobs in electronic data processing, there is much diversity in occupational designation and in salary levels. Salaries, however, are generally set through existing job evaluation and personnel classification systems. Studies show that the new jobs are generally rated at the top of the office salary structure, higher than comparable jobs in other data processing.

The training of computer personnel has been mainly the responsibility of the employers and has been performed for them by representatives of the computer manufacturers, either at the manufacturers' facilities or in the employers' offices or on the job. Many colleges throughout the nation, however, have computers and are using them for educational purposes.

---

[9] Hammerman, Herbert. "Implications of Automation for Business Education." An unpublished paper presented to the Workshop on Automation and Business Education at the Convention of the United Business Schools Association, Washington, D. C., November 1, 1962.

IMPLICATIONS FOR CLASSROOM INSTRUCTION

New media in teaching business machines point up a definite need for a more rounded training in the various skills needed by the well-trained office worker. Among the most important of these skills is that of familiarity with various types of business machines.

Teachers are generally desirous of offering some instruction in office machines either in separate classes or as units integrated into the regular business classes of a skill building nature—typewriting, clerical office training, secretarial office training, or automation office practice. Whether or not they do this is determined by three factors: (1) Is the administration willing? (2) Are the machines or funds to procure them available? (3) Is there a teacher available to give the instruction?

Adding-listing machines, calculating machines, and the electric typewriter are basic to any business machine instruction. A minimum working knowledge of these three types of machines is required in practically all types of office positions that are generally available to the beginning office worker. Where there is no budgetary provision for the purchase of machines for instructional purposes the school can start by using the equipment on hand. Nearly all schools have at least one adding or calculating machine. Electric typewriters, common in some part of the business program, are assumed to be available.

If the equipment is available, the administration should be encouraged to make the offering of a meaningful program in machines instruction possible. The minimum program will be that of a "working knowledge" of business machines. This means that the student will know what the machine is like when he encounters it in an office and will be possessed of a sufficient knowledge of the machine to enable him to build skill on the job with a minimum of help from the office supervisor.

A school that is equipped with a sufficient number of machines in a wide enough variety will be able to offer a "mastery of fundamentals." This means that the student can perform all the various operations inherent to the particular machine. Through using it, he can build his speed of manipulation.

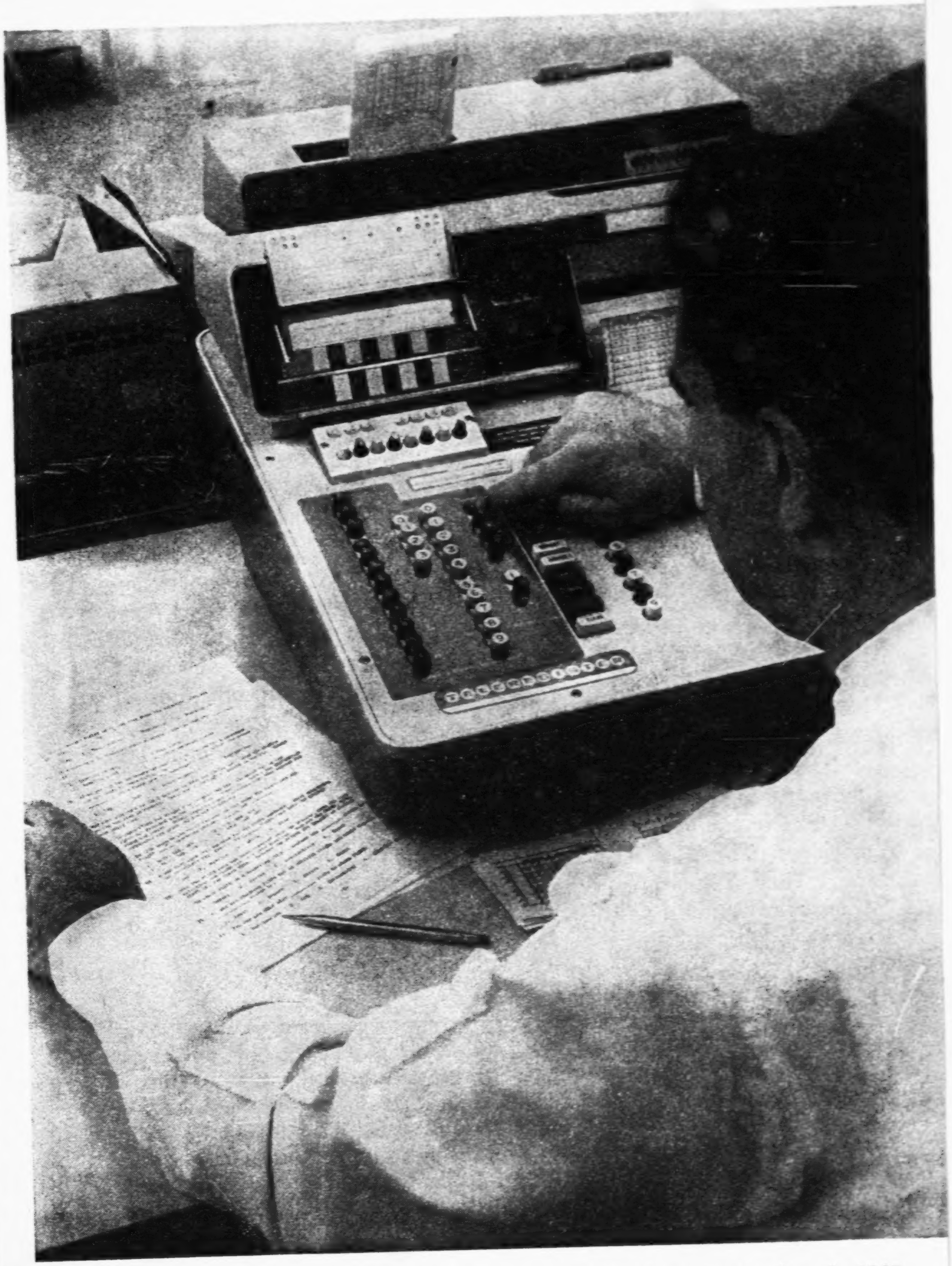
The concentrated class time with a fully equipped laboratory available will provide for "vocational skill." This means that the student is prepared to go into an office, sit down at the machine, and do a first-class piece of work without wasting his own or the employer's time. Vocational skill is usually required in large offices where the job consists of tasks requiring the steady operation of the machines throughout the working day.

The amount of time that will be spent on the machines will vary with the emphasis that is being stressed. As mentioned earlier, however, more and more of the time that should be devoted to the instruction in business machines will be spent on the functions that the equipment will perform.

The business machines instruction, as it relates to automation and data processing, aims to develop a basic understanding of the principles of processing data by automatic means. It attempts to remove some of the doubts and fears that exist when a new employee meets a new language and a new array of mechanical gadgetry. The process of automation as it applies to data handling can be taught along with the "hands on" time that is typical of business machines instruction. The aim might be to acquaint the student with the terminology and processes of handling data by automatic means. Much of this can be accomplished with the new electric typewriters and a ten-key adding machine.

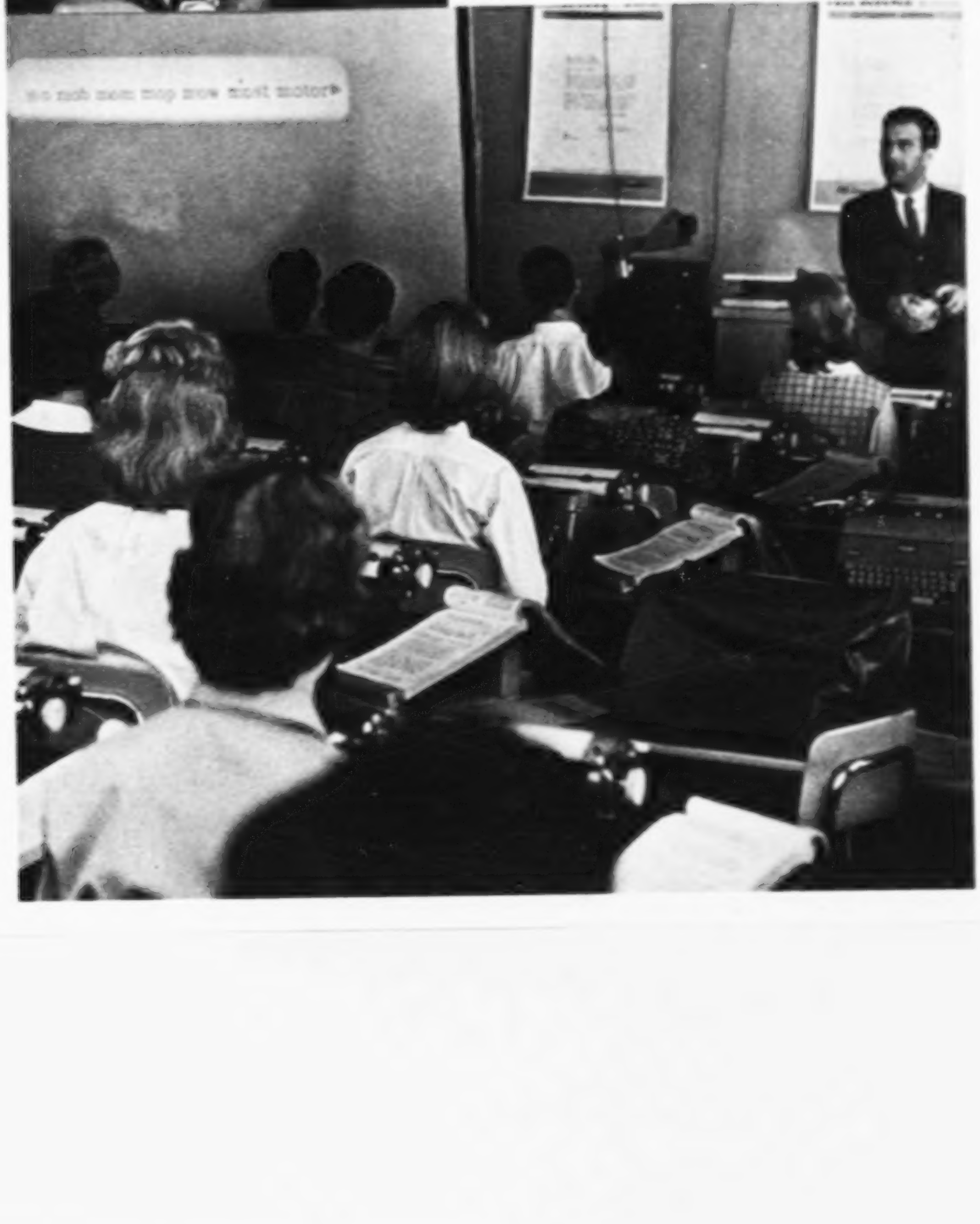
The emphasis today is upon the development of a broad, general understanding of business data processing with a familiarity with a wide spectrum of equipment and a knowledge of the possible uses of available machines. The U. S. Department of Employment has a slogan: "You Can't Hold Tomorrow's Jobs with Yesterday's Skills." The business teachers of America will do well to use this slogan in teaching for tomorrow's jobs.

(Next Page) While schools have been using electronic teaching machines on a limited scale, United Air Lines has started using a nation-wide network of them. The passenger agent trainee selects button on the Teleregister Instamatic which has been set up as an instructional unit. Answers are recorded on cards as the agent operates the machine and refers to his programed lesson (at left). The complete program is stored in Instamatic "memory drum" at United's Reservations Center in Denver.



This computer-controlled "teacher" was viewed by educators attending the 1965 convention of the NEA's Department of Audiovisual Instruction.

The controlled reader has an important role in teaching typewriting in Fremont (California) Union High School District.


no mob mom mop mow most motor

Foothill College presents its multiple-rate dictation laboratory

Foothill College presents its business machines laboratory in this photograph.

Team-teaching gives a new dimension to the classes in Fremont (California) Union High School District.

CHAPTER 14

Newer Instructional Media in Business Mathematics

Roswell E. Fairbank, State University of New York at Albany

Business mathematics is not a totally new experience for most students; they have had many years of instruction in general arithmetic and mathematics in elementary and junior high school. What, then, is the benefit to these students of another semester or year in a course titled business mathematics? The answer lies in the characteristics of the students and of the subject matter.

The typical class in business mathematics has a few students who are strong in their quantitative aptitude and skills; a greater number of the students are average or below average in their mastery of basic skills, understanding of quantitative processes, and problem-solving ability. Some students in the class are frustrated with mathematics and have a deep distaste for it, engendered by their previous lack of success. For these maturing students, business mathematics is a rather different, and perhaps final, opportunity to develop a functional personal use or vocational skill in arithmetic. All of these students will eventually apply their skills and knowledge to their personal problems as consumers; some will use these learnings to get and hold a job in business; some need the course as a background for other business subjects such as bookkeeping and office practice.

The business mathematics student is expected to increase his speed and accuracy in mental and written calculation with the fundamental operations (addition, subtraction, multiplication, division) using whole numbers, common fractions, mixed numbers, decimals, and percents. While this work is "old hat" for all, each student can be challenged to produce greater quantities of work at a faster rate and with a higher degree of accuracy. But the ultimate, and really significant, goal of business mathematics is to increase skill in solving a variety of practical, quantitative problems in business areas such as payroll, saving and checking accounts, invoices, sales slips, marking goods, discount, taxes (real property and income), insurance, installment sales, stock and bond purchases and sales, distribution of profit, graphs, practical measurements, business statements, and shipping.

The heterogeneity of his learning group and the diversity of his subject matter require the business mathematics teacher to close up existing gaps in old learning while forging ahead through a body of new learning. The teacher must determine the individual and group skills of his students, individualize instruction, and provide extensive remedial instruction. To do all these things more effectively, business mathematics teachers are continually searching for and experimenting with good ideas wherever they can find them—in the literature of business mathematics, elementary arithmetic, and high school mathematics; or in the literature of other business subjects. Many teachers have thus discovered and are actively using newer teaching media, such as programed instruction and teaching machines, the overhead projector, the filmstrip, television, tape, films, team teaching, and the modern textbook.

Programed Instruction and Teaching Machines

Some business mathematics teachers are using programed instruction, with or without teaching machines. Most of these programs are of the Skinnerian, linear type, that are aptly described as follows:

> [A program] is usually a series of items, questions, or statements to each of which, in order, the student is asked to make a response. His response may be to fill in a word left blank, to answer a question, to select one of a series of multiple-choice answers, to indicate agreement or disagreement, or to solve a problem and record the answer. As soon as he has responded to the item, he is permitted to see the correct response so that he can tell immediately whether his response has been the right one. But the items are so skillfully written and the steps are so small between them that the student practices mostly correct responses, rather than errors, and the sequence of items is skillfully arranged to take the student from responses he already knows, through new responses he is able to make because of the other responses he knows, to the final responses; the new knowledge it is intended that he should command.
>
> To sum up, then, these are essential elements of programed instruction: a) an ordered sequence of stimulus items, b) to each of which a student responds in some specified way, c) his responses being reinforced by immediate knowledge of results, d) so that he moves by small steps, e) therefore making few errors and practicing mostly correct responses, f) from what he knows, by a process of successively closer approximation, toward what he is supposed to learn from the program.[1]

---

[1] Schramm, Wilbur. "Programmed Instruction Today and Tomorrow." Reprinted in *Programmed Instruction*. New York: Fund for the Advancement of Education, June 1964. pp. 98-99.

Although several sources report that forty to sixty percent of commercially developed programs are in the areas of arithmetic and mathematics, little if any programing has been done specifically for high school business mathematics. Many of the programs designed for general arithmetic and general mathematics, however, are appropriate for fundamental process work in business mathematics. At least one four-volume program has been prepared for collegiate business mathematics,[2] and it is probable that portions of this program might be used for high school students.

The future of programed instruction is not yet fully clear, but it may well find a place along with other materials and devices as a useful supplement to, if not a replacement for, more conventional materials. There is substantial evidence that students *do* learn from programed instruction; students benefit from the carefully designed and logically presented material, immediate feedback, and the encouragement of success. On the other hand, the findings are not so clear concerning how well material so learned is retained, nor has the final answer yet been determined as to how long a student can be motivated to pursue such study without extensive stimulation and supplementation by a teacher.

Programed instruction seems worthwhile for remedial work in fundamentals for the less able student of business mathematics, or for supplemental work for the more able student. Learners are permitted, within limits, to work at their own pace and under self-direction; to some extent, therefore, programed instruction frees the teacher for other supervisory and teaching activities or for special assistance to students who need it.

The relationship of programed instruction and teaching machines is important: A program may be used without a teaching machine, but a teaching machine cannot operate without a program. Most teaching machines are little more than a simple device or mechanism that is designed to hold the program and control the learner's movement through the program. For this reason, as well as for economy, most programs are available in loose leaf or book form; a machine is optional. Any teaching machine may add to motivation and it may control the student's forward or backward movement through the program. A sophisticated teaching machine may facilitate the use of stimuli other than the written word; but, no matter how simple or sophisticated, the machine without a basic program is nothing but useless hardware.

---

[2] Huffman, Harry. *Programmed Business Mathematics.* New York: Gregg Publishing Division, McGraw-Hill Book Company, 1962.

The Overhead Projector

Relatively inexpensive, simple to operate, and portable, the overhead projector is a most useful tool for the business mathematics teacher. In using it, the teacher can keep his eye on the learning group while writing on a transparent plate or roll of tape; well-lighted, magnified images are projected behind and above the writer well within the view of learners.

The overhead projector is equally useful for materials that have been prepared in advance or for spontaneously developed materials. For example, the teacher may anticipate in advance the need for a projected business form on which calculations are to be demonstrated during a class session. The form might be a sales slip, invoice, tax bill, check, note, or deposit slip prepared in advance of the class. The teacher can rule the form on a transparent plate with wax crayon or special pen; if he anticipates reuse of the form, he can have a permanent form prepared by any one of several inexpensive processes, resulting in either black-and-white or colored images. During the class session, he can project the prepared form, inserting whatever material he wishes, in whatever sequence, and with whatever supplemental explanation he desires. Permanently printed forms can be cleaned of the wax pencil overlay and reused; temporary forms can be discarded.

Some teachers like to present fully illustrated problem solutions on the chalkboard, and to reuse these illustrations in several classes. This is frequently difficult because the chalkboard is inaccessible before the mathematics class and the room must be used by someone else after the class. The overhead transparency provides a neat solution to this problem; material can be prepared outside the classroom, carried in, used, and stored for the next session.

The overhead projector has a unique facility for showing relationships of parts to wholes by means of the "overlay." For example, a teacher might wish to show that selling price is made up of the parts or elements of cost, overhead, and net profit. To do this he would prepare one transparency showing a bar or rectangle representing selling price. A second transparency, superimposed or overlaid on the first, would show a portion of the bar or rectangle to be an amount representing cost; a third overlay would show an additional portion to be shown, and so on. The same idea might be used in showing a blank form—perhaps a check, note, or invoice—then overlaying the handwritten insertions as they would appear on the finished form.

The overhead projector, with a reusable roll of cellophane tape, is especially handy for spontaneously written materials. Perhaps the teacher wishes to visually support an oral calculation or explanation that he is presenting. He can easily do so by switching on the projector and writing whatever he wishes without loss of contact with his learners.

It seems that, for either spontaneous or planned use, the overhead projector has all the advantages of the chalkboard, and many more as well. It is clean; images are bright; and the writing plate is easy to reach in a normal writing position. Material can be easily reused or destroyed. Costs of basic equipment and supplies are relatively low. Perhaps best of all, the projector requires almost no special skill to operate; it has few moving parts and it is not subject to frequent breakdown. Probably every business mathematics classroom should be equipped with one of these projectors, and the teacher should use it frequently.

Filmstrip or Slide Projector and Controlled Reader

The conventional filmstrip or slide projector can be used effectively in business mathematics for visually presenting drill work in the fundamental processes, and for simple problem work. This projector has the advantage of presenting a limited field of material in enlarged form for whatever period of time the teacher desires. Color projections can add variety to otherwise routine and monotonous drill work. While filmstrips are beyond the normal capacity of classroom teachers to prepare, anyone can make effective colored slides with relatively simple and inexpensive equipment. By so doing, the teacher can have the very special kind of material that he wants for a specific student or group of students. By using several projectors and multiple screens, possibly coordinating [illegible] while changing others.

A special variation of the filmstrip projector–the controlled reader or instrument trainer–has the advantage of providing automatic control and timing of the projections. Material can be made to appear and disappear horizontally as well as vertically at any desired rate. The image intensity of the controlled reader is sufficiently high to permit its use in a fully lighted room; thus, the learner can view the projection and make written notations or calculations as well.

The larger controlled readers are designed for use with classes or groups of students; smaller readers are especially useful for remedial work with individual students. The manufacturers of these devices also produce a complete line of filmstrips for arithmetic, general mathematics, and business mathematics. Maximum economy can be gained from investment in the machines by using them in other classes as well; classes such as typewriting, shorthand, filing, and office machines.

Closed-Circuit Television

Closed-circuit television seems to have little promise for improving the overall effectiveness of group instruction in high school business mathematics, nor will it outmode the "live" instructor. Certainly television, whether open- or closed-circuit, makes it possible for one teacher to reach hundreds or thousands of students, and, with a shortage of teachers or classrooms, television instruction would be far better than no instruction at all. It is probable, also, that with viewing groups of more than two hundred students, television instruction is no more expensive than live instruction. It is equally true that television instruction requires exhaustive planning and superb presentation by a top-flight instructor using the best of visual materials and devices that can be developed and operated by a team of specialized workers. Through the use of video-tape, such top-flight performances can be edited, polished, and used over and over again.

Nonetheless, television is essentially an inflexible, impersonal, one-way medium that encourages all viewers rather passively to participate in instruction that, at any one point of time, can be appropriate for only a portion of the total group. The highly impersonal relationship of the studio instructor and students, a characteristic of television instruction, hardly seems to fill the need in business mathematics for individualized remedial instruction and general stimulation toward learning. While groups of television students can be carried through group review and drills of fundamental processes, including orally or visually stimulated speed and accuracy drills, there is little incentive for the student to respond with vigor and enthusiasm. It is easier to sit back and watch the instructor kill himself with effort.

A two-way, "talkback" sound system theoretically provides auditory communication between student and instructor, but what student dares to raise a question about some minor point when he has to work through a maze of microphones, speakers, and switches while several hundred other students are probably criticizing him for making a fool of himself? Only mature, interested, self-confident students will persist in the face of such odds.

Television students have an excellent view of a few words, numerals, or a piece of a chart or graph, but if the whole of a chart or problem solution is presented in one shot, the detail is too small to be seen. For example, in demonstrating the solution of a problem in computing markup, the teacher can show the parts in a size that students can see, but he has great difficulty in showing the total solution in a size that students can see. With ingenuity, such technical problems can be minimized, but they cannot be totally eliminated.

There is some doubt, too, that the subject matter of high school business mathematics is sufficiently complex to require the highly specialized talents of a superb TV mathematics instructor. It is more likely that a greater number of less talented but capable individual classroom teachers, working closely with students on material appropriate to the individual's needs and using the best of modern textbooks, programed materials, and visual devices, *can* do the job more effectively.

Tape and Other Recording Devices

Most calculations in practical business situations arise from visual stimuli; that is, the worker actually sees the figures with which he is to work. Nonetheless, arithmetic operation is really a mental process involving rapid and accurate recall, recognition, association, and judgment. To develop these mental skills, teachers of business mathematics frequently use oral-aural stimuli; they give students exercises to increase the speed and accuracy of responses to simple quantitative situations.

The tape recorder can be helpful in this oral-aural work. By prerecording a variety of drills and then playing them back to students, the teacher is freed to observe group performance, to assist individuals, or to do other

is freed to observe group performance, to assist individuals, or to do other

worthwhile teaching work. Exercises covering many different kinds of fundamental process work can be prerecorded at different speeds and difficulty levels appropriate to the development of the learners. A few minutes of each class period devoted to group work with such exercises should significantly increase the speed and accuracy of responses and should add zest and enthusiasm to the classroom. These tapes can be used, also, for remedial work with individual students who need specialized exercises in certain areas such as addition or multiplication "facts." Such exercises may be recorded without answers, or answers may be given at appropriate intervals to reinforce learning through immediate knowledge of results.

Motion Picture Films

Films have limited, but significant, use in business mathematics to increase understanding of the business situations out of which quantitative problems arise, and to demonstrate the use of business forms. For example, a good film showing the processes of opening and using a checking account acquaints the student with general procedures and terminology. A short film showing the actual procedures of discounting a note helps to clarify the sequence of events and the underlying rationale of the transaction. Or a pictorial account of the way in which property taxes are levied and collected gives learners a better perception of the interrelationships of the elements with which they work in tax problems. Countless other examples of appropriate background films might be cited.

Probably too few such films are used in business mathematics classes. Some of the reasons given are: (a) appropriate films do not exist, (b) teachers do not know of or think of appropriate existing films, (c) teachers begrudge the time given to such noncomputational activities, and (d) teachers do not recognize that problem-solving is a complex process of decision-making that requires extensive knowledge of the factors in the problem situation, as well as skill in the manipulation of specific quantities.

Team Teaching

A major precept of team teaching is that each one of a group of teachers has some particular knowledge or teaching skill that makes him uniquely superior to the others for handling some phase of instruction. This precept presupposes a body of subject matter that is so highly specialized or sufficiently diversified that differences among teachers are significant.

significant.

The subject matter of business mathematics does not seem to warrant the team approach. It seems reasonable that any teacher who is competent to teach a portion of the course should be capable of handling the total of the course. Rather than joining into such teams with rotating teaching responsibility—which usually involves larger pooled groups of learners—business math teachers might better seek informal pooling of ideas and materials, with each teacher directing his efforts to increasing his effectiveness with his own smaller group of students.

The Textbook

Fortunately, textbook authors and publishers have been increasingly successful in their efforts to produce materials that meet the needs of teachers and students. Today's business mathematics textbooks are attractively and durably bound, easy to read, and generously illustrated. While color is not used as extensively as it might be, the type faces are varied and illustrations are used to emphasize particular points. Appropriate problem materials are interspersed with review and drill work on fundamentals, even in the early portions of the books, so the student can see the point and purpose for reviewing fundamental operations. Extensive explanatory and background material provides the student with the vocabulary and conceptual relationships necessary for rationally thinking his way through a problem rather than solving it by rote. Methods of solution are both described and illustrated. Some newer textbooks include the basic elements of the "new" mathematics; these elements provide a rational basis for arithmetic processes and methods of solution. Binary numeration is treated in some books as a basis for understanding computer operation, and there is some movement toward simple descriptive statistics.

Generally, modern textbooks develop concepts from the simple to the complex. Problems of personal mathematics are introduced before the more complicated vocational mathematics problems. Textbooks provide ample material for frequent review, and they provide quantities of optional material to meet the diverse needs of many different students and teachers of markedly different courses, all titled "business mathematics." The teacher must make intelligent choices among these materials to find that which is best for him and for his students; he must also consider the option of workbooks and achievement tests that are usually available to supplement the text.

Even the inexperienced teacher can feel secure with answer keys, well-organized solutions books and, in some cases, excellent "methods" books—teachers manuals or handbooks—that are prepared by the author to help the teacher make the most effective use of the textbook as a learning tool.

The business teacher who uses today's textbook and its supporting materials in the manner for which they were designed can generally count on good results; the student, of course, must be reasonably skillful in learning through the medium of the printed word, symbol, or illustration.

THE FUTURE

The French phrase, "Plus ça change, plus c'est la même chose,"—the more it changes, the more it remains the same—aptly describes the foreseeable future of business mathematics. Business mathematics students of the future probably will be as heterogeneous in interests as they now are, and the goals and content of the course will remain much the same. Business, industry, and government will be making increasing use of computers and automated calculating equipment; nonetheless, people will continue to need the relatively simple arithmetic skills to solve their personal business problems, and the world of work will continue to need skilled business mathematicians.

The teacher of business mathematics will be prominent in the classroom of tomorrow as in the classroom of today, building his basic instruction around the ever-present textbook; but he will be making more extensive use of several different media to provide individualized learning experiences appropriate for each student of his class. Perhaps the starting point for this individualized instruction will be an exhaustive, computer-analyzed pretest to determine precisely where each individual stands in his mathematics skills and understandings. Possibly the computer will be used to identify the specific learning patterns of the individual student, and his responses to the available learning media. Perhaps, also, courses will be of variable length to enable better students to move ahead to other courses while the slower student takes longer.

Students will be spending more of their classroom time with specialized learning materials in the privacy of individual work stations. These work stations, or carrels, will be equipped with a simple calculating machine to perform many of the computations now done by pen or pencil. Perhaps each work station will have a small closed-circuit television set by means of which the student or teacher can dial-select an infinite number of films and timed visual or oral materials fitted to his needs. These materials will be prepared, stored, and projected by a central technical staff of the school.

Despite all the technical aids and impersonalized approaches, or perhaps because of them, students will spend some portion of their learning time in the presence of a real, "flesh and blood" teacher—because learning is a human activity, humans are a complex of intellect and emotion, and no adequate substitute will have been found for the teacher who is devoted to his subject and to his learners.

CHAPTER 15

New Developments in Business Communications

HARRY HUFFMAN, Virginia Polytechnic Institute, Blacksburg
SYRELL ROGOVIN LEAHY, Thomas J. Watson Research Center, Yorktown Heights, New York

Three major developments have recently occurred that may profoundly affect business communications courses. The first is the emergence of a new body of subject matter known as data communications; the second, new discoveries by linguists about the orderliness of the English language; and the third, a new teaching tool—the programed text.

DATA COMMUNICATIONS

Previously, information collection and communication was looked upon as a nonproductive process that was both overhead and a burden to the productive part of a business or industrial enterprise. In the past decade, however, many blue collars were bleached; and now over half of the working force are white collar. The attitude toward information collection and communication has changed. The need to know and communicate has given rise to a knowledge industry which involves collecting, processing, digesting, interpreting, and communicating information.

The wheels of the knowledge industry are not only turned by managers, correspondents, secretaries, stenographers, general office workers, and unit record and computer operators, but also they are speeded by 80 million telephones operated by 2,500 independent telephone companies, including the Bell Telephone System and Western Union Telegraph Company.

The broad task of communication involves much more than we previously imagined. For example, a new concept of communication involves a management information system. For illustrative purposes, imagine the system operating at three levels. The first level is top management which no longer can plan strategy on the basis of last year's or last month's facts and figures—it needs yesterday's facts and figures. The second level is middle management; it sends up to top management a digest of operations together with comparisons of these operations with the previous day, week, month, and year. Middle management reaches down into the third level, the office, to obtain basic information on inventory, order-entry, and production. Highly competitive businesses and industries are spending millions of dollars for research to improve their information systems. The merging of the communication activities of managers, correspondents, and report writers with the entire management information system is imminent in many organizations, if it has not already taken place.

A new body of subject matter is springing up—data communications. At the moment it can be defined as the transmission of both voice and data. The data may include print copy, handwritten copy, pictures, drawings, punched cards, and punched tape. The purpose of data communications is to move information according to seven criteria:

Function—what the communications system has to do for business.
Distribution—the number of places involved in moving information.
Volume—the total amount or bulk of information to be moved in a given period of time.
Urgency—the speed requirements.
Language—the nature of the language, including grammatical structure and physical structure such as handwriting, print, coded tape, and so on.
Accuracy—tolerable error performance that will provide the desired results.
Cost—evaluated in terms of the benefits to be derived.[1]

So important is the new subject matter that the American Telephone and Telegraph Company has established an Education Advisory Panel, the members of which are E. Dana Gibson of San Diego State College (California), Norman F. Kallous, State University of Iowa, Adrian M. McDonough, Wharton School of Finance and Commerce, University of Pennsylvania, and Harry Huffman, Virginia Polytechnic Institute. The objective of the panel is to assist in the development of instructional materials for data communications to be incorporated in existing courses. Materials will be developed for three levels—colleges and universities, junior and community colleges, and high schools. These materials promise to be of considerable interest to instructors of business communications, if nothing more than to present their students with a broad perspective of the total business communications picture.

---

[1] Adapted from an article by Edgar C. Gentle, Jr. "Keying the Executive to Real Time Concepts." *Bell Telephone Magazine*, Summer 1964. p. 8.

DISCOVERIES BY LINGUISTS

English has usually represented a series of "do's" and "don'ts" to the students and it is no wonder they fail to learn them or learn them all with the greatest of difficulty. What could be more boring?

Lately, however, teachers of English have come to believe that recent work in linguistics can be used in the teaching of English, with the result that the subject matter has become interesting, lively, and stimulating; hopefully with the added effect that it teaches better. In this new approach, English is seen to have a structure from which regular patterns emerge. Shorter, simpler sentences are shown to form a kind of core in the language from which longer, more complicated sentences can be derived by means of regular rules. So-called "exceptions" are no longer presented as separate anomalies, each one to be memorized painstakingly, but they are seen as the operation of particular rules within a comprehensible framework.

Four graduate students at Virginia Polytechnic Institute embarked on a detailed description of business correspondence. They drew at random 100 letters from business communication textbooks. The letters were described by the authors as examples of effective letters, or even those that [illegible] had actually been used to obtain action.

The 100 letters contained 904 sentences which were then copied on cards to be analyzed in the following manner.

1. What kind of sentence pattern was used?
2. What kind of sentence opener was used?
3. Was the verb active, passive, or a form of "be"?
4. What kinds of direct objects were used in transitive sentences?
5. What was the relationship of these factors to the type of letter?

After each sentence had been analyzed, it was then coded by numeric system so that it could later be punched into a card. When the sentence codes were punched into cards, they were sorted. The factors and their relationship to the type of letter were tabulated.

Nine types of letters were identified–sales, order, collection, application, inquiry, adjustment, credit, claim, and goodwill. Not only did the students want to have a linguistic description of business correspondence, but they also wanted to know whether or not there were any peculiarities about the grammar used in various types of letters. One might immediately formulate the hypothesis that the types of business letters would have no relation to grammatical structure. It was, however, discovered, that there is some evidence that certain types of letters have special grammatical peculiarities.

Teachers of business English and composition frequently give their students a great deal of instruction on various matters such as: (1) Use a large number of "dog bite man sentences" as described by Rudolph Flesch, a great advocate of using large numbers of transitive sentences. (2) Avoid the passive voice like poison. We wanted an answer to, "Is the passive voice used in what is considered an example of good business communication?" (3) Avoid the use of the verb *be* and all its forms, since immature writers hide their main verb by changing it to a noun and then using the verb *be*, which results in a weak sentence. What percent of the sentences used in business communication contain the verb *be*? What are some examples of its use? (4) See that a large percent of sentences have sentence openers. Sentence openers include the adverb, the adverbial clause, the adverbial phrase, sentence connectors (*however, therefore, nevertheless, yet, likewise, thus, hence*), appositive to the subject, *there* transformation, and noun of address. Participial and infinitive phrases may also be used as openers. The problem of sentence openers actually concerns the use of loose and periodic sentences.

General Description of Expository Writing

has the pattern (D) N V-t (D) N in kernel form. The second most frequent sentence pattern was an intransitive sentence, stating time or place by means of an adverb or a prepositional phrase, the pattern being (D) N V (Adverb or prepositional phrase). It accounted for 17 percent of the sentences. Examples include "Your order will arrive soon" or "Your order will go out Tuesday."

The third most frequent sentence pattern, 16 percent, was a descriptive sentence using a form of the verb *be*. The pattern is (D) N be Adjective. In kernel form, this sentence frequently appears as "The linen is beautiful." The fourth most frequent sentence pattern is a classification sentence, 6 percent, the pattern (D) N be (D) N. In kernel form, an example of this sentence is "The supervisors are women."

The fifth type is a transitive sentence with an indirect object, 4 percent, the pattern being (D) N V-tg (D) N (D) N. In kernel form, two nouns follow a "giving" type of verb. An example is "We sent Mr. Jenkins a shipment."

The pattern stating place or time with a *be* verb was used in 3 percent of the cases, (D) N be Adverb. In kernel form, an example of this sentence is "The customer is outside."

Of the nine patterns, the remaining three were used relatively infrequently (less than 1 percent) in the 904 sentences studied in this particular sample. They are: (D) N V Adjective, 0.9 percent; (D) N V-tc (D) N (D) N, 0.6 percent; and (D) N V (D) N, 0.3 percent.

In the (D) N V Adjective pattern, the intransitive verb falls in the category of *seem, feel,* and other linking verbs. An example of the kernel sentence is "The fabric seems smooth." The pattern (D) N V-tc (D) N (D) N includes two kernel type sentences. "The committee chose Miss Adkins secretary," and "The men painted the house green." In American English two verbs are commonly used in the pattern (D) N V (D) N. The verbs are *remain* and *become*. The kernel sentence might be "Mr. Roberts became our customer."

Among the 904 sentences there were six sentence fragments without subjects or verbs.

Statistically, the percent of use of the kernel sentence patterns does not vary from one type of letter to another. The small differences discovered were apparently the result of sampling variations.

Even though the "dog bite man" sentence occupies 51 percent of the sentences in this sample of business correspondence, other sentence pat- [illegible] used, which are important to effective business correspondence.

All transitive sentences, including "giving" and "complementing" verbs occupied 56 percent of the sentences analyzed. Of the 56 percent, 40 percent had a noun acting as a direct object, 5 percent had an infinitive acting as a direct object, and 11 percent had a clause acting as a direct object.

Statistically, claim letters had a higher percent of clauses as direct objects as compared to other types of letters. Eleven percent of the sentences in the total correspondence had clauses as direct objects of transitive verbs. Claim letters had 23 percent. An example of one of the clause patterns in the claim letters is "We request that you kindly make an adjustment on your recent invoice." On the other hand collection letters used very few clauses as direct objects, only 4 percent. Consequently, from the data obtained, it appears that claim letters are heavily laden with the clauses and collection letters are free, or relatively free, from clauses as direct objects.

Forms of the Verb Be and Passive Verbs

Twenty-five percent of the sentences contained verbs in the form of *be* and 7.4 percent contained passive verbs. Passive verbs used wisely have important functions to perform. Regulations are often stated in passive voice to eliminate the author of the regulation. This is particularly true of unpopular regulations. An example is "Smoking is not permitted." Obviously someone made the regulation. Passive voice permits the omission of the name of the author of the most likely unpopular regulation. Another regulation in passive voice might be "Employees are required to park in Lot 3."

Passive voice is often used to place the topic being discussed in subject position in all of a series of sentences. Otherwise the topic may appear as a direct object or in some other position. When the subject of a sentence is first acting and then later is acted upon, passive voice thus permits it to be always in first position for the sake of emphasis and continuity of the discussion. It appears, however, that in well-constructed letters the passive voice is not widely used, 7.4 percent. This fact should be brought to the attention of the students. The verb *be* was used in 25 percent of the cases. Apparently the verb *be* has a very important function to perform—in giving times, places, and descriptions. Used incorrectly, of course, it is an extremely weak verb; used correctly it is vital to business correspondence as a main verb.

The use of active, passive, and *be* verbs apparently does not differ greatly among the various types of letters. Small differences are apparently due to sampling variations.

The use of active, passive, and *be* verbs apparently does not differ

Sentence Openers

The use of a sentence opener includes the basic distinction between what is called a periodic sentence and a loose sentence. Periodic sentences have openers prior to the basic sentence pattern. Loose sentences typically follow the basic sentence with subordinate information.

Christensen[2] made a study of contemporary expository and narrative writing and found an average of 24 percent of the sentences containing openers of various types, almost wholly adverbial in nature. In this study 31 percent of the sentences had openers. Approximately 10 percent of the sentences opened with an adverbial clause, 10 percent with an adverbial phrase, 6 percent with an adverb, 3 percent with a sentence connector, and the remaining 2 percent with others.

The 10 percent of sentences opening with an adverbial clause began with words such as *because, since, although,* or *after* followed by a subordinate sentence pattern and then followed by the main or independent clause. Another 10 percent opened with an adverbial phrase such as

---

[2] Christensen, Francis. "Notes Toward a New Rhetoric." *College English,* October 1963. p. 8.

"On Tuesday" or "In the next mail." Six percent opened with an adverb such as "apparently," "frequently," or "usually." Three percent of the sentences opened with connectors such as *therefore, hence, thus,* and so on. Other openers such as appositives to the subject, the "there transformation," nouns of address, and so on were used so infrequently that they seem insignificant. Students, however, need to know how to use the infrequent openers when they are required to do so even in a very small percent of the cases. Statistically, collection letters had adverbs as openers in 13 percent of the cases and claim letters in 11 percent. The average percentage of use in all letters was 6.

It appears evident that there is some grammatical peculiarity about collection letters and claim letters according to the data of this particular study.

A Summary of the Findings

Before a great deal can be done to improve sentence construction in business correspondence, we need additional detailed descriptions of compositions of good writers. The authors do not promote the idea that there should be a formula to expository business writing, but do believe that a great deal more attention needs to be given to the structure of effective sentences. A great number of problems can be solved. Certainly an understanding of basic structure of good sentences will help people know what sentences can do for them. The basic sentence patterns can be turned into rich and varied sentences by means of modification. Furthermore, grammatical difficulties can be isolated for special study. Also, punctuation conventions can be more easily learned.

A better understanding of the structure of sentences used in effective business correspondence will enable students to use the structures available to them more effectively and also perhaps to identify errors of logic. Frequently students and writers produce monstrosities for sentences because they become lost and do not look critically at the kernel about which they are distributing many modifiers.

As far as sentence openers are concerned, there appears to be little difference between the use of openers in effective business expository writing as compared to nonbusiness or literary and narrative writing.

Some Hopeful Applications

The authors believe that a study of sentence patterns can lead to the improvement of the variety and emphasis in sentences used in business communications.

Variety and Sentence Patterns. Authorities in business communications claim that writing shortcomings often result because students do not know how acceptable English sentences are constructed and how properly to surround the basic elements with modifiers. Compound and complex sentences are poorly constructed because students do not know their origins and what can be done to generate effective compound and complex sentences.

Loose and periodic sentences are forever mysteries to some students because they do not know how to derive a loose sentence from a group of related basic sentence patterns. Furthermore, they do not know how to take a conversational loose sentence and convert it into a periodic sentence. One of the basic differences between conversational communications and written communications is that in conversational communications loose sentences predominate whereas in effective written communications the percent of periodic sentences used is greatly increased. In effective business writing, according to the percent of sentence openers used, it appears that between 20 to 30 percent of sentences are periodic.

Emphasis and Sentence Patterns. The basic sentence patterns or the kernel sentences pose no problem of emphasis. The basic sentence patterns permit omission of no part and consequently the entire unit is emphatic. We cannot rely on kernel sentences to express all our ideas, however, because such sentences are short, choppy, and repetitious and furthermore, do not encompass all sentence types; e.g. questions, passives, etc. In order for a basic sentence pattern to be complete, every word must be present. Thus we cannot say that the beginning, middle, or ending is more important than any other part. When, however, modifiers are introduced and other grammatical devices are used, then psychologically the mind seems to give importance to the beginnings and endings of sentences. Therefore, teachers of the field of business communications often spend a great deal of time instructing students on the importance of the beginnings and endings of sentences because once the reader has grasped the basic elements of the sentences he is reading or hearing he may ignore the rest. Hence, the problem in business communications is often that of designing sentences to cause the reader to read to the very end.

Long involved sentences may sometimes be vastly improved if the basic sentence patterns included in the independent and dependent clauses are identified. Attention then may be given to the relative importance of each basic sentence included. Important ideas should be given a prominent position and less important ideas a subordinated position. The analysis of long involved sentences also may lead to the discovery that perhaps one or more of the ideas should be placed in independent clauses.

The identification of the basic patterns of a sentence may reveal the weak use of the verb "to be" linking two complex and involved ideas which might be better stated by using another sentence pattern. In many instances, the "to be" sentence pattern is a weak one unless it is used properly.

The Programed Text

Teachers of applied English grammar and the fundamentals of business correspondence are painfully aware that the performance of their students in the areas of writing and speaking often leaves much to be desired. As serious educators, we must admit the possibility that the teaching rather than the learning has been, at least in part, at fault and attempt to correct the situation from the teaching point of view. Certainly in the field of business subjects, where our students face a critical public daily, and, as it were, reflect directly on their teachers, we must attempt wholeheartedly to teach in the most effective ways possible.

Traditionally, a teacher faces a class of 20 to 40 students (as many as several hundred in a lecture hall but let us look at the simpler case). What is this single teacher up against? Singly, he faces many students; singly he faces many problems; singly he has little time but the many students with their many questions and problems require much time. The student as an individual has, compared to the teacher, much time to devote to the course but because he is surrounded by many other students just like him, he is forced to sit through tiresome explanations (of things he may understand). Furthermore, he may fail to understand some important point but not want to take up precious time asking questions that he thinks other people will consider tiresome. He may want more practice on something but every time an assignment is given the teacher must correct 20 to 40 papers. In addition, lack of time may prevent the teacher from writing detailed explanations of why certain items were wrong.

What, on the other hand, do we envision as the ideal situation? Certainly a situation in which we had one teacher for each student would tend towards the ideal. In this situation, each student could progress at his own rate of work. No one would have to hurry on account of his fellow students; nor would he be held back because of slower people. But this is not completely ideal. In addition, we would choose to have groups of students meet with a teacher so that each student could listen to what his fellow students were thinking about the course material and what problems each one had encountered.

In order to approximate the "ideal" situation the authors believe that a good programed textbook combined with a good teacher can alleviate many of the problems both the students and teachers face. Students can work at their own pace. They can work through portions that were hard to understand a second time. They can discover immediately whether an answer was right or wrong, and if it was wrong they can learn what the correct answer ought to be. Furthermore, there is still the opportunity to meet with the teacher as a class to air problems that exist after everyone has completed scientific portions of the program; and at this time, ideas can be exchanged.

PART 3

SELECTED REFERENCES ON THE NEW INSTRUCTIONAL MEDIA

ALLEN, MABEL Z. "The Motion Picture in Business Education." *Business Education Forum* 7:16-18; January 1953.

ALLEN, WILLIAM H. "Audio-Visual Communication Research." *Encyclopedia of Educational Research.* Third edition. (Edited by Chester W. Harris.) New York: Macmillan Co., 1960. pp. 115-137.

AUDIOVISUAL INSTRUCTION, A DEPARTMENT OF THE NATIONAL EDUCATION ASSOCIATION. *Audiovisual Instruction.* Washington, D.C.: the Department. Monthly except July and August. See special topic issues for February 1957, November 1962, December 1962, February 1963, April 1964, and February 1965.

AUDIOVISUAL INSTRUCTION, A DEPARTMENT OF THE NATIONAL EDUCATION ASSOCIATION. *AV Communication Review,* Washington, D.C.: the Department, Quarterly. Special references in Spring 1957, Summer 1957, November-December 1963, and Fall, 1964.

AUDIOVISUAL INSTRUCTIONAL SERVICE, A DIVISION OF THE NATIONAL EDUCATION ASSOCIATION. *Selected Audiovisual Source and Reference List.* Washington, D.C.: National Education Association, 1964.

NATIONAL SOCIETY FOR THE STUDY OF EDUCATION. *Audio-Visual Materials of Instruction.* Forty-Eighth Yearbook, Part 1, Chicago: University of Chicago Press, 1949. 320 pp.

BARBER, SHIRLEY. *An Experimental Study in Teaching Shorthand Using the Tachistoscope.* Unpublished doctoral thesis. Greeley: Colorado State College, 1961.

BECKER, JAMES L. *A Programed Guide to Writing Auto-Instructional Programs.* Camden, N.J.: RCA Educational Programs, RCA Service Co., 1964. 189 pp.

BEEDE, RUTH C. "Try These Bulletin Board Ideas." *Business Education World* 43:30; February 1963.

BENDER, ERIC. "The Other Kind of Teaching." *Harper's Magazine* 230:48-55; January 1965.

BENNETT, ROBERT J. *Construction of a Colored Slide Series and Tape Recording on Consumer Cooperatives.* Unpublished master's project. San Jose, Calif.: San Jose State College, 19[illegible]1. 48 pp.

BERGNER, LOUISE C. "Team Teaching in Typewriting." *American Business Education* 18:249-251; May 1962.

BERNASEK, ROGER G. *The Production of a Colored Slide Filmstrip and Tape Recording for Public Relations and Guidance in Business Education.* Unpublished master's thesis. Madison: University of Wisconsin, 1959.

Bliss, Dorothy D. *Audio-Visual Aids and Their Adaptability.* Unpublished master's thesis. Fresno, Calif.: Fresno State College, 1957.

Bragg, Bernard P. *Audio-Visual Aids and Devices for Use in Teaching Bookkeeping.* Unpublished master's project. San Jose, Calif.: San Jose State College, 1959. 27 pp.

Brown, James W., and Thornton, James W., Jr. *New Media in Higher Education.* Washington, D. C.: Association for Higher Education and the National Education Association, 1963. 182 pp.

Brown, John W.; Lewis, Richard B.; and Harcleroad, Fred F. *A-V Instruction: Materials and Methods.* New York: McGraw-Hill Book Co., 1959. xxii + 554 pp.

Bucher, Charles A. *Administration of School Health and Physical Education Programs.* Third edition. St. Louis: C. V. Mosby Co., 1963. 498 pp.

Bugelski, Bergen Richard. *The Psychology of Learning.* New York: Henry Holt and Company, Inc., 1956. 523 pp.

Bushnell, Donald D. *The Role of the Computer in Future Instructional Systems.* Technological Development Project of the National Education Association under a contract from the U.S. Office of Education. *AV Communication Review,* Supplement 7. Washington, D.C.: National Education Association, 1963. 70 pp.

Campbell, Donald Lee. *An Experiment in Programmed Business Mathematics at Lane High School.* Unpublished master's thesis. Blacksburg: Virginia Polytechnic Institute, 1962.

Center for Programed Instruction. *Programed Instruction.* New York: Columbia University, 1964. Vol. 8.

Charvonia, Ronald. "Are You Equipping Your Students for Advancement?" *Business Education World* 44:25, 31-34; January 1964.

Chiantelli, Leo William. *A Series of Photographic Slides and Accompanying Narration for Use in Presenting Principles of Advertising Layout.* Unpublished master's thesis. San Jose, Calif.: San Jose State College, 1963. 70 pp.

Christensen, Francis. "Notes Toward a New Rhetoric." *College English* 25:7-18; October 1963.

Christiani, Vincent A. "Team Learning and Related Techniques." *American Business Education* 18:239-244; May 1962.

Cohodes, Aaron, editor. "Audio-Visual Administration Study." *Nation's Schools* 71:61-80; May 1963.

Cook, Fred S. "Team Teaching in Business Education." *Recent and Projected Developments in Business Education.* Vol. 2, National Business Education Yearbook. Washington, D. C.: National Business Education Association, 1964. Chapter 6, pp. 95-106.

Cook, Fred S. "Television Sets and Teaching Machines." *Business Education Facilities, Supplies and Aids.* Vol. 36, Yearbook Series. Eastern Business Teachers Association, 1963. pp. 325-38.

Cornelia, Nicholas J. *The Development of a Self-Instruction Manual for the Burroughs Sensimatic F 100.* Unpublished doctoral dissertation. New York: New York University, 1957. 199 pp.

Costello, Lawrence F., and Gordon, George N. *Teach with Television: A Guide to Instructional TV.* New York: Hastings House. 1961. 192 pp.

Crandall, Lars G. *An Experimental Study in Teaching Shorthand Using Tapes, Text, and Special Notebooks.* Unpublished doctoral dissertation. Greeley: Colorado State College, 1960. 185 pp.

Crawford, T. James. "Television Typing Research." *Balance Sheet* 39:148-49, 154; December 1957.

Crispin, Margaret. "Moorestown Innovates Practice Interview." *Business Education Observer* 34:17-18, 21; Spring 1963.

Cross, A. J. Foy, and Cypher, Irene F. *Audio-Visual Education.* New York: Thomas Y. Crowell Co., 1961. 415 pp.

Crum, Dwight R. "Bibliography of Film and Filmstrip Sources for Business Education." *Business Education Forum* 7:19-22; January 1953.

Dale, Edgar. *Audio-Visual Methods in Teaching.* Revised edition. New York: Dryden Press (Holt, Rinehart and Winston), 1954. 534 pp.

Dale, Richard S. "Teaching Accounting with the Overhead Projector." *Journal of Business Education* 38:198-200; February 1963.

Dameron, Vernon G. "The Place of Audio-Visual Materials in Education." *Business Education Forum* 3:12, 41, 44; October 1948.

Dannenberg, Raymond A. "Programmed Instruction for Distributive Education." *American Vocational Journal* 38:27-28; April 1963.

Day, Elmore M. "Implications for the Teaching of Business by Programmed Learning." *American Business Education* 18:221-223, 226; May 1962.

DeBernardis, Amo and others. *Planning Schools for New Media.* Portland, Oreg.: Portland State College, 1961. 72 pp.

DeCecco, J. P. *Educational Technology.* New York: Henry Holt and Company, 1964.

deGrazia, Alfred, and Sohn, David A., editors. *Programs, Teachers and Machines,* New York: Bantam Books, Matrix Edition Series, 1964. 309 pp.

deGrazia, Alfred, and Sohn, David A., editors. *Revolution in Teaching: New Theory, Technology, and Curricula.* New York: Bantam Books, Matrix Education Series, 1964. 310 pp.

Delaney, Marjorie, and Brown, Frances. "The Voice Recorder—A Shorthand Teaching Device." *Business Education Forum* 9:25; February 1955.

Diamond, Robert M. *A Guide to Instructional Television.* New York: McGraw-Hill Book Co., 1964. ix + 304 pp.

Douglas, Lloyd V.; Blanford, James T.; and Anderson, Ruth I. *Teaching Business Subjects.* Englewood Cliffs, N. J.: Prentice-Hall 1958. 538 pp.

Dreyfus, Lee S., and Bradley, Wallace M., editors. *Televised Instruction* (A Series of Lectures). Detroit: Mass Communications Center, Wayne State University, 1962. viii + 173 pp.

Dugan, J. M., and others. *Guide to Audio-Visual Presentations.* New York: Wolf Business Publications, 1963. 149 pp.

Educational Media Council. *Educational Media Index, Business Education and Training.* A project under contract from the U.S. Department of Health, Education, and Welfare, Office of Education. New York: McGraw-Hill Book Company, 1964.

Estvan, Frank J. "Instruction Materials." Special topic, *Review of Educational Research* 26:111-197; April 1956.

Ettinger, Clifford. "Filmstrips in Business Education." *Business Education Forum* 7:14-16; January 1953.

Fenner, Mildred Sandison, editor. "Educational Technology." Special feature, *NEA Journal* 53:24-34; April 1964.

Finn, James D. *The Audio-Visual Equipment Manual.* New York: Dryden Press (Holt, Rinehart and Winston), 1957. 363 pp.

Finn, James D. "Instructional Technology." *Bulletin of the National Association of Secondary-School Principals* 47:99-119; May 1963.

Fleser, Clare M. "Wireless System for Stenographic Training." *Journal of Business Education* 40:106-108; December 1964.

Forkner, Hamden L.; Swanson, Robert M.; and Thompson, Robert J. *The Teaching of Bookkeeping.* Monograph 101. Cincinnati: South-Western Publishing Co., 1960. 67 pp.

Fry, Edward B. *Teaching Machines and Programed Instruction, An Introduction.* New York: McGraw-Hill Book Co., 1963. 244 pp.

Fuller, R. Buckminster. *Education Automation: Freeing the Scholar To Return to His Studies.* Carbondale: Southern Illinois University Press, 1964. 88 pp.

Gage, N. L., editor. *Handbook of Research on Teaching.* A Project of the American Educational Research Association. Skokie, Ill.: Rand McNally and Co., 1963. xiv + 1,218 pp.

Galanter, Eugene H., editor. *Automatic Teaching: The State of the Art.* New York: John Wiley and Sons, 1959. 198 pp.

Gentle, Edgar C., Jr. "Keying the Executive to Real Time Concepts." *Bell Telephone Magazine,* Summer 1964.

Gibson, E. Dana. "Automation—The Clerical Practice Killer." *Business Education Forum* 17:11-12; February 1963.

Gibson, E. Dana. "Ideal Audio-Visual Equipment for Typewriting." *Business Education Forum* 8:15-18; November 1953.

Glazier, Robert C. "Television Classroom." *NEA Journal* 47:285-287; May 1958.

Gray, Genevieve. "Educational Technology and the Individual Student." *Phi Delta Kappan* 46:6-9; September 1964.

Green, Helen H. "Chalkboards, Bulletin Boards, Graphs, Charts, Pictures, and Photographs." *Business Education Facilities, Supplies, and Aids.* Vol. 36, Yearbook Series. Eastern Business Teachers Association, 1963. pp. 300-324.

GRUBBS, ROBERT L. "Shorthand via Television." *Business Education Forum* 13:16-17, 29; October 1958.

HAAN, COLLINS T., and ADAMS, ROGER C. "Experimentation at Fremont High School." *Journal of Secondary Education* 37:274-79; May 1962.

HAAS, KENNETH B., and PACKER, HARRY Q. *Preparation and Use of Visual Aids.* Third edition. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1955. 381 pp.

HAGGBLADE, BERLE. "Shortening the Learning Time in Shorthand." *Business Education Forum* 18:11-12; October 1963.

HALVERSON, GAYLON LEONARD. *The Development and Evaluation of Programmed Instruction Materials for Use in Supplementing the Teaching of Bookkeeping.* Unpublished master's thesis. Cedar Falls: State College of Iowa, 1963.

HARRIS, BROTHER PHILIP, O. S. F. "Using the Opaque Projector in Business Education." *Business Education Forum* 7:12-14; January 1953.

HEDLEY, MARTHA KAY. *Development of Programed Instruction in Selected Basic Operations of the IBM 402 Accounting Machine.* Unpublished master's thesis. Knoxville: University of Tennessee, 1963.

HOLLAND, JOSEPHINE, and LAMBERT, ALLIE DALE. "Shorthand and the Overhead Projector." *Business Education Forum* 17:18-27; March 1963.

HOLTON, JAMES S., and OTHERS. *Sound Language Teaching: The State of the Art Today.* New York: University Publishers, 1961. 249 pp.

HOUSE, F. WAYNE. *Factors Affecting Student Achievement in Beginning Bookkeeping in the High School.* Delta Pi Epsilon Research Award Series. Stillwater: Oklahoma Agricultural and Mechanical College, 1953. 96 pp.

HUEBENER, THEODORE. *Audio-Visual Techniques in Teaching Foreign Languages: A Practical Handbook.* New York: New York University Press, 1960. 163 pp.

HUFFMAN, HARRY. *Programmed Business Mathematics.* New York: Gregg Publishing Division, McGraw-Hill Book Co., 1962.

HUFFMAN, HARRY. "Programed Instruction in Business Education." *Recent and Projected Developments in Business Education.* Vol. 2, National Business Education Yearbook. Washington, D. C.: National Business Education Association, 1964. Chapter 5, pp. 73-94.

HUFFMAN, HARRY. "Programed Instruction: Its Implications for Business Education." *Catholic Business Education Review* 14:24-31; Winter 1963.

HUGHES, JOHN LEO. *Programmed Instruction for Schools and Industry.* Chicago: Science Research Associates, 1962. 299 pp.

IANNIZZI, ELIZABETH, and ROBINSON, CHARLES. "Team Teaching Worked for Us in Office Practice." *Business Education World* 43:18-20; January 1963.

JOHNSTON, CHESTER. "Teaching Typewriting via Television." *Business Education Forum* 17:12-13; November 1962.

JONES, REVUS SHELTON. *An Experiment in Programmed Business Mathematics at Churchland High School, Churchland, Virginia.* Unpublished master's thesis. Blacksburg: Virginia Polytechnic Institute, 1962.

KEMP, JERROLD E. *Planning and Producing Audiovisual Materials.* San Francisco: Chandler Publishing Company, 1963.

Kelly, Edward C. "Television in the Typewriting Classroom." *Business Education Forum* 15:13-15; November 1960.

Kendig, Kathryn Dye, and Martin, Gaither Lee. *The ABC's of TV*. San Jose, Calif.: The Spartan Bookstore, 1957.

Kinder, James S. *Audio-Visual Materials and Techniques*. Second edition. New York: American Book Company, 1959. 592 pp.

Kinder, James S., and McClusky, F. Dean, editors. *The Audio-Visual Reader*. Dubuque, Iowa: William C. Brown Co., 1954. 382 pp.

Kleinmeyer, Janet. "Programed Instruction for Basic Typewriting." *Secretarial Education with a Future*. Vol. 19, American Business Education Yearbook. Eastern Business Teachers Association and National Business Teachers Association, 1962. pp. 280-284.

Kline, (Mrs.) Randall Miller. *A Study To Determine the Effectiveness of the Use of the Skillbuilder Controlled Reader as an Instructional Device in Developing Speed and Accuracy in Beginning Typewriting at the Secondary Level*. Unpublished doctoral thesis. Columbus: Ohio State University, 1961.

Kornfeld, L. "What Every Schoolman Should Know About Data Processing." *School Management* 6:59-68; October 1962; and 6:79-92; November 1962.

Kumata, Hideya. *An Inventory of Instructional Television Research*. Ann Arbor: University of Michigan Educational Radio and Television Center, 1956.

Lamb, Marion M. *Your First Year of Teaching Typewriting*. Second edition. Cincinnati: South-Western Publishing Co., 1959. 290 pp.

Lambert, Philip, editor. "The Teacher and the Machine." *Journal of Educational Research*, June 1962.

Lanham, Frank W., feature editor. "Data Processing." *Business Education Forum* 19:3, 5-16; February 1965.

Lanham, Frank W. "Programmed Instruction for Business Classes." *American Business Education* 18:218-220, 251; May 1962.

Lanza, Anthony R. "Overhead Projector Slides: Do It Yourself or Ready-Made!" *Journal of Business Education* 35:137; December 1959.

Laurie, Edward J. "Teaching Aids For Typewriting Instruction." *Business Education Forum* 10:20-28; January 1956.

Leach, Clayton E. "Card Punch Training: Another Marketable Skill for Our Graduates." *Business Education World* 44:26-27; May 1964.

Lewis, Philip. *Educational Television Guidebook*. New York: McGraw-Hill Book Co., 1961. 238 pp.

Lewis, Philip. "Emerging Technology and Instructional Systems." *National Elementary Principal* 43:34-39; September 1963.

Lewis, Philip. "Instructional Technology Takes a Giant Step Forward." *Illinois Journal of Education* 54:7-10; October 1963.

Lewis, Philip, editor. "Programed Instruction." *Education* 83:387-420; March 1963.

Lewis, Philip. "Technology and Methodology Look Ahead." *Educational Screen and Audio-Visual Guide* 42:366-67; July 1963.

Lobb, M. Delbert. *Utilization of the Staff in Education, A Report of a Three-Year Study, 1957-1960.* Jefferson County, Colorado, School District R-1, June 1960.

Lowe, Harold Carter. *Recommended Aids for the Bookkeeping Teacher.* Unpublished master's project. Los Angeles: University of Southern California, 1955.

Lumsdane, Arthur A. "Instruments and Media of Instruction." *Handbook of Research on Teaching.* A Project of the American Educational Research Association. (Edited by N. L. Gage.) Skokie, Ill.: Rand McNally and Co., 1963. Chapter 12, pp. 583-682.

Lumsdaine, Arthur A., and Glaser, Robert, editors. *Teaching Machines and Programmed Learning: A Source Book.* Washington: National Education Association, Department of Audiovisual Instruction, 1960. 724 pp.

McClusky, Frederick Dean. *The A-V Bibliography.* Revised edition. Dubuque, Iowa: William C. Brown Co., 1955. xi + 218 pp.

McGrath, Harold M. "Teaching 'Introduction to Business' by Closed-Circuit Television." *American Business Education* 18:235-238; May 1962.

Mager, Robert Frank. *Preparing Objectives for Programmed Instruction.* San Francisco: Fearon Publishers, 1961. 62 pp.

Malsbary, Dean R., editor. "New Media and Techniques for Teaching Business." *American Business Education* 18:195-255; May 1962.

Manning, Gerry. "Programmed Instruction Applied to Clerical Records." *Business Education Forum* 17:23, 27; May 1963.

Margulies, Stuart. "Another Look at Programmed Instruction in Business Education." *American Business Education* 18:224-226; May 1962.

Margulies, Stuart, and Eigen, Lewis D. *Applied Programed Instruction.* New York: John Wiley and Sons, 1962. 387 pp.

Marietta, E. L. *Newer Developments in Business Teacher Education.* Bulletin 78 of the National Association for Business Teacher Education, 1963. pp. 65-66.

Marietta, E. L.; Stringer, Ivan; and Jacobs, Russell. "95 Students Learn To Type in One Room." *Business Education World* 41:19, 38; September 1960.

Markell, William. "Programmed Instruction in Accounting." *Journal of Business Education* 39:321-322; May 1964.

May, Mark A., and Lumsdaine, A. A. *Learning from Films.* New Haven: Yale University Press, 1958. 357 pp.

Menacker, Julius. "Team Teaching Social Studies and Business." *Journal of Business Education* 38:103-104; December 1962.

Miles, Matthew B., editor. *Innovation in Education.* New York: Bureau of Publications, Teachers College, Columbia University, 1964. 689 pp.

Miller, Aaron M. "Film Techniques in Distributive Education." *Journal of Business Education* 37:289-90; April 1962.

Miller, Joanne M. *Motivation in Teaching General Business.* Monograph 107. Cincinnati: South-Western Publishing Co., 1963. 29 pp.

MINTZ, BETTY S. "Visual Demonstrations in Bookkeeping." *Business Education Forum* 9:19-20; December 1954.

MORGAN, DAN E. *Audio-Visual Aids for Teaching Selected Phases of General Business.* Unpublished master's thesis. Emporia: Kansas State Teachers College, 1955. 69 pp.

MOSCOW, DAVID H. "Individualizing Instruction with Paperbacks." *NEA Journal* 53:21-22; April 1964.

MORLAN, JOHN E. *Preparation of Inexpensive Teaching Materials.* San Francisco: Chandler Publishing Company, 1963.

MOSELEY, EUGENIA. "The Role of Television in Teaching Transcription." *Business Education Forum* 8:23-24, 40; October 1953.

MUSICK, DAVID C. *The Adaptation of a Programmed Unit for Teaching Interest Computations Prepared for Post-High School Graduates and College Freshmen to the Junior and Senior Level of Secondary Schools.* Unpublished master's thesis. Blacksburg: Virginia Polytechnic Institute, 1962.

NAJAM, EDWARD W., editor. *Materials and Techniques for the Language Laboratory.* A Report of the Language Laboratory Conference, Purdue University, 1961. Bloomington: Indiana University, Research Center, 1962.

National Education Association, Project on Automation. *Automation and Challenges to Education.* (Edited by Luther H. Evans and George E. Arnstein.) Washington, D. C.: the Association, 1961. 200 pp.

O'BRIEN, M. CLAIRE. "California Surveys Experimental Programs in Business Education." *National Association of Secondary-School Principals Bulletin* 46:99-102; January 1962.

OFIEST, GABRIEL D. *Programed Instruction: A Guide for Senior Management.* New York: American Management Association. 1965.

OFIEST, GABRIEL D., and MEIERHENRY, WESLEY C., editors. *Trends in Programed Instruction.* Washington, D.C.: National Education Association, Department of Audiovisual Instruction, 1964. 289 pp.

PADEN, DONALD W. "Presenting Economic Principles by Television." (pp. 70-73) *Economic Education Experiences of Enterprising Teachers.* A Report Developed from the 1962 Entries in the Kazanjian Foundation Awards Program for the Teaching of Economics. Joint Council on Economic Education and the Calvin K. Kazanjian Foundation, 1963. 93 pp.

PALMER, ELISE O. *Development and Evaluation of Multiple-Channel Dictation Tapes in Beginning Shorthand Classes.* Unpublished doctoral thesis. Knoxville: University of Tennessee, 1963.

PALMER, HAROLD O. *Tachistoscope Training for Beginning Typing Students in a Secondary School.* Unpublished doctoral dissertation. Corvallis: Oregon State College, 1955.

PARFET, JAMES A. "Tape Recorders, Record Players, and Projectors." *Business Education Facilities, Supplies, and Aids.* Vol. 36, Yearbook Series. Eastern Business Teachers Association, 1963. pp. 281-89.

PASEWARK, WILLIAM R. *The Effectiveness of Television as a Medium of Learn-*

ing Typewriting. Unpublished doctoral dissertation. New York: New York University, 1956.

Pasewark, William R. "Teaching Typewriting Through Television." *Balance Sheet* 40:388-92; May 1959.

Penn, Stanley. "Computers Take Over Many Tasks in Office, Factory, Laboratory." *Wall Street Journal,* July 6, 1964. pp. 1 and 7.

Peterson, Joanne. *Teaching-Learning Guides for Adding and Calculating Machines.* Unpublished master's thesis. Minneapolis: University of Minnesota, 1962. 105 pp.

Place, Irene. "Automation and Clerical Office Practice." *Business Education Forum* 12: 14-16; February 1958.

Place, Irene. "Data Processing: Systems Analysis." *Recent and Projected Developments in Business Education.* Vol. 2, National Business Education Yearbook. Washington, D. C.: National Business Education Association, 1964. Chapter 7, pp. 107-121.

Pressey, S. L. "A Puncture of the Huge 'Programing' Boom?" *Teachers College Record* 65:413-418; February 1964.

Price, Carol. "Television, The 21" Classroom." *Business Education Forum* 15:33-35; December 1960.

Price, Ray, editor. *Auditory and Visual Aids in Business Education.* Monograph 66. Cincinnati: South-Western Publishing Co., 1956. 48 pp.

Putney, Agnes. "Using an Overhead Projector in Beginning Shorthand." *Journal of Business Education* 40:19; October 1964.

Rahe, Harves. "Selected Devices for Teaching Typewriting." *Business Education Forum* 12:18-20; November 1957.

Rains, Clellan C.; Shepard, Ellen; and Stella, Mary. "Teaching Shorthand by Television." *Business Education World* 39:15-18; May 1959.

Reeves, Dorothy. "Making Good Teaching Better Through Selected Teaching Aids." *Business Education Forum* 14:10-13; February 1960.

Ricketts, Mary Katherine. *Preparation and Evaluation of Programmed Materials for Introductory Lessons in Beginning Shorthand.* Unpublished master's thesis. Knoxville: University of Tennessee, 1962. See also: *National Business Education Quarterly* 32:44; October 1963.

Rimbach, Barbara. "Programmed Instruction for Retail Trainees." *Journal of Business Education* 40:70-71; November 1964.

Robinson, Charles. "Audio Visual Teaching Aids: 8mm Sound Film." *Journal of Business Education* 38:72-73; November 1962.

Robinson, Charles. "The Overhead Projector." *Journal of Business Education* 38:251; March 1963.

Roman, John C. "Office Machines Survey." *Balance Sheet* 43:122-123; November 1961.

Ruegg, Robert J. "Instrument Training Techniques for Business Education." *Balance Sheet* 42:8-12; September 1960.

Ruegg, Robert J. "Teaching Elementary Typewriting Through the Use of a

Reading Instrument." *Secretarial Education with a Future.* American Business Education Yearbook, Vol. 19. Eastern Business Teachers Association and the National Business Teachers Associations, 1962. pp. 260-279.

Salser, Carl, Jr. "What the Electronic Age Can Mean to Business Education." *National Business Education Quarterly* 26:45-51; October 1957.

Sands, Lester B. *Audio-Visual Procedures in Teaching.* New York: Ronald Press Co., 1956. 670 pp.

Schantz, Lois A. "Assimilating Office Problems in the Classroom." *Journal of Business Education* 37:327-28; May 1962.

Schimmoler, Sister Mary Leo, O. P. *Audio-Visual Techniques for the Elementary Bookkeeping Teacher.* Unpublished master's thesis. Washington: Catholic University of America, 1950.

Schramm, Wilbur. *The Research on Programed Instruction: An Annotated Bibliography.* U.S. Department of Health, Education, and Welfare, Office of Education. Washington, D.C.: Government Printing Office, 1964.

Schramm, Wilbur, editor. *The Impact of Educational Television.* Selected Studies from the Research Sponsored by the National Educational Television and Radio Center. Urbana: University of Illinois Press, 1960. viii + 247 pp.

Selden, William, and Meyer, Bernadine, editors. *Business Education Facilities, Supplies, and Aids.* Vol. 36, Yearbook Series. Eastern Business Teachers Association, 1963. 338 pp.

Singkofer, Martin D. *A Study of the Effectiveness of the Overhead Projector Relative to the Teaching of Bookkeeping in High School.* Unpublished master's thesis. Madison: University of Wisconsin, 1961. 28 pp.

Smith, Mary Howard, editor. *Using Television in the Classroom.* (Midwest Program on Airborne Television Instruction) New York: McGraw-Hill Book Co., 1961. 118 pp.

"Special Educational Television Report." *American School Board Journal* 148:27-58; February 1964.

Spiecker, Marjorie McLeod. "Planning for the Use of Projectors and Recorders." *Business Education Forum* 8:9-12; January 1954.

Stein, Sarah C. "Motion Picture Film Loops for Beginning Typing." *Journal of Business Education* 35:222-224; February 1960.

Stolurow, Lawrence M. *Teaching by Machine.* U.S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Monograph No. 6. Washington, D.C.: Government Printing Office, 1961.

Stolurow, Lawrence M., and West, Leonard J. "Teaching Machines and Self-Instructional Programming." *Delta Pi Epsilon Journal* 3:1-27; April 1961.

Stophel, John Carroll. *Available Teaching Aids for Bookkeeping and Accounting Instruction with Evaluations by Teachers.* Unpublished master's thesis. Knoxville: University of Tennessee, 1950.

Strain, Elizabeth Ann. *An Evaluation of Free and Inexpensive Teaching Materials in the Field of Office Machines and Clerical Practice.* Unpublished master's thesis. Boston: Boston University, 1955. 101 pp.

TARBET, DONALD G. *Television and Our Schools.* New York: The Ronald Press Co., 1961. 268 pp.

TAYLOR, HELEN W. *Development and Evaluation of Programmed Materials in the Presentation of Theory in Beginning Shorthand Classes.* Unpublished doctoral thesis. Knoxville: University of Tennessee, 1963.

TEDESCO, PAULINE. "Team Teaching in Typing." *Journal of Business Education* 38:10-11; October 1962.

TEDESCO, PAULINE. "Team Teaching—Some Experimental Results." *American Business Education* 18:245-248; May 1962.

TERRY, GEORGE R. *Office Management and Control: The Actions of Administrative Management.* Fourth edition. Homewood, Ill.: Richard D. Irwin, Inc., 1962. 744 pp.

THAL, HELEN M. "Using Programmed Instruction in Teaching Family Finance." *Topics.* New York: Institute of Life Insurance 13:1-5; Fall 1963.

THOMPSON, ROBERT J. "Cybernation and the Secretary." *Journal of Business Education* 39:189-190; February 1964.

THOMPSON, ROBERT J. "Instructional Aids for Effective Business Teaching." Los Altos, Calif.: Foothill College, 1961. (Mimeographed)

THORNE, CLIFTON C., and ARMSTRONG, MARGARET. "Producing a Consumer Television Show." *Business Education Forum* 8:14-16; March 1954.

THORNE, MARIAN H. "Data Processing Systems in the Secretarial Practice Class." *Journal of Business Education* 39:12-13; October 1963.

TIEMANN, ERNEST, and FRYE, RAY. "Local Production of Instructional Material." *American Business Education* 18:252-255; May 1962.

TONER, SHARON, and TUCKER, RITA. *A Study of Appropriate Dictation Speeds with the Use of Electronic Equipment in the Teaching of Shorthand.* Unpublished master's thesis. Madison: University of Wisconsin, 1961. 129 pp.

TONNE, HERBERT A. "The Ubiquitous Teaching Machine." *Journal of Business Education* 36:192-193; February 1961.

TONNE, HERBERT A.; POPHAM, ESTELLE I.; and FREEMAN, M. HERBERT. *Methods of Teaching Business Subjects.* New York: Gregg Division, McGraw-Hill Book Co., 1957. 448 pp.

TRACY, MYLES A. "Family Finance: Timely Topic for Television." *Journal of Business Education* 35:179-180; January 1960.

TRUMP, J. LLOYD, and BAYNHAM, DORSEY. *Focus on Change—Guide to Better Schools.* Skokie, Ill.: Rand McNally and Company, 1961. 147 pp.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, OFFICE OF EDUCATION. *Programs '63.* Washington, D.C.: Government Printing Office, 1963.

VANDERVEER, ELIZABETH T. "The Multiple-Listening Station in Shorthand Speed Building." *Business Education Forum* 18:13-14, 17; October 1963.

VERRY, DANA H. *The Effect of a Twenty-Hour Reading Program with the Controlled Reader on Selected Office Practice Skills . . . .* Unpublished doctoral dissertation. Pittsburgh: University of Pittsburgh, 1963.

WARD, RUTH B. "Use the Projector for Motivating, Teaching, Grading." *Business Education World* 44:12-13, 62; March 1964.

WEST, LEONARD J. *300 Commas.* New York: McGraw-Hill Book Company, 1964.

WHITLOCK, JAMES W. *Automatic Data Processing in Education.* New York: Macmillan Company, 1964. 144 pp.

WILSON, HARMON W. "An Overview of Visual Aid Projections." *Business Education Forum* 7:7-9; January 1953.

WINGER, FRED E. *The Determination of the Significance of Tachistoscopic Training in Word Perception as Applied to Beginning Typewriting Instruction.* Unpublished doctoral dissertation. Eugene: University of Oregon, 1951.

WINGER, FRED E. "The Overhead Projector in Business Education." *Business Education Forum* 7:9-11; January 1953.

WITHERS, HARRIETT H. "Teaching the Skill Subjects by Television." *American Business Education* 18:227-234; May 1962.

WITTICH, WALTER A., and FOWLKES, JOHN G. *Audio-Visual Paths to Learning* (A Comparison of Three Classroom Methods of Using Education Sound Films). New York: Harper & Bros., 1946. 135 pp.

WITTICH, WALTER A., and SCHULLER, CHARLES F. *Audiovisual Materials: Their Nature and Use.* Third edition. New York: Harper & Bros., 1962. 500 pp.

WITTY, PAUL. "Some Results of Eight Yearly Studies of TV." *School and Society* 86:287-289; June 1958.

WOODCOCK, BARBARA A. *Educational Television and its Implications for Business Education.* Unpublished master's thesis. Madison: University of Wisconsin, 1957. 94 pp.

ZELLERS, EUDORA M. *Visual Aids Used in Teaching Basic Business.* Unpublished master's thesis. Minneapolis: University of Minnesota, 1959.

NATIONAL BUSINESS EDUCATION ASSOCIATION

EXECUTIVE BOARD, 1964-65

National Officers

Mary Alice Wittenberg President	Los Angeles City Schools Los Angeles, California
Harry Huffman Vice-President	Virginia Polytechnic Institute Blacksburg, Virginia
Lloyd L. Garrison Treasurer	Oklahoma State University Stillwater, Oklahoma
Paul F. Muse Past-President	Indiana State University Terre Haute, Indiana
Hollis Guy Executive Director	NEA Center Washington, D.C.

Presidents of NBEA Divisions

Leonard L. Carpenter Administrators	Portland Public Schools Portland, Oregon
Adrienne Frosch International	Lafayette High School Brooklyn, New York
George W. Anderson Research	University of Pittsburgh Pittsburgh, Pennsylvania
Albert C. Fries Teacher Education	Chico State College Chico, California
Enos C. Perry Vocational Business Education	Chicago Public Schools Chicago, Illinois

Presidents of NBEA Regional Associations

Herbert A. Tonne Eastern	New York University New York, New York
Elizabeth O'Dell Southern	University of South Carolina Columbia, South Carolina
Homer F. Long North-Central	Detroit Business Institute Detroit, Michigan
John E. Binnion Mountain-Plains	University of Denver Denver, Colorado
John H. Linn Western	San Francisco State College San Francisco, California

Regional Representatives

Richard D. Clanton Southern	State Department of Education Baton Rouge, Louisiana
Cletus Clow Eastern	New Rochelle High School New Rochelle, New York
Lloyd L. Garrison Mountain-Plains	Oklahoma State University Stillwater, Oklahoma
Frank B. Gilmer, Jr. Mountain-Plains	Del Norte High School Albuquerque, New Mexico
Paul F. Muse North-Central	Indiana State University Terre Haute, Indiana
Paul M. Pair North-Central	Pair Schools of Business Chicago, Illinois
Donald J. Tate Western	Arizona State University Tempe, Arizona
Robert J. Thompson Western	Foothill College Los Altos Hills, California
Leslie Whale North-Central	Detroit Public Schools Detroit, Michigan
Theodore Woodward Southern	George Peabody College for Teachers Nashville, Tennessee

NBEA PUBLICATIONS COMMITTEE

Harry Huffman Chairman	Virginia Polytechnic Institute Blacksburg, Virginia
Jeanne Skawinski	Plainville High School Plainville, Connecticut
Enos C. Perry	Chicago Public Schools Chicago, Illinois
Dorothy Travis	Central High School Grand Forks, North Dakota
Theodore Yerian	Oregon State University Corvallis, Oregon
Hollis Guy NBEA Executive Director	NEA Center Washington, D.C.

Publisher: NATIONAL BUSINESS EDUCATION ASSOCIATION
A Department of the National Education Association
1201 Sixteenth Street, N.W., Washington, D.C. 20036